NATURAL HISTORY

OF THE

MAMMALIA.

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CONTAINING THE ORDER

RODENTIA, OR GNAWING MAMMALIA;

WITH

22 ILLUSTRATIONS ENGRAVED ON STEEL, AND ENGRAVINGS ON WOOD.

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ORDER—GLIRES, OR RODENTIA.

Mammalia, having the jaws provided in front with long, curved, cylindrical (or nearly cylindrical) teeth, the exposed ends of which are bevelled off on the inner surface, so that they terminate in a sharp, cutting edge; these teeth, two in number in each jaw, (sometimes four in the upper jaw), separated by a wide toothless space from the molars, which have the crowns flat, or studded with blunt and but little elevated tubercles: the condyle of the lower jaw longitudinal or rounded, and inclosed by the glenoid cavity in such a manner as to permit very little lateral motion to the jaw, which, however, moves freely in the longitudinal direction: surface of the brain smooth, or very nearly so; anterior pair of the optic lobes (the nates) the largest; cerebellum exposed.

The Rodentia, so called from their gnawing propensities, form one of the most clearly defined groups of the Mammalia; a group which has representations in all parts of the world, and the species of which are very numerous. They feed upon vegetable substances, and are of small size, few exceeding the Common Hare in bulk. The most striking characters of the Rodents are those furnished by the teeth; the long vacant space which separates the incisors in front, here adapted for gnawing, from the masticating teeth behind. The gnawing teeth in most Rodents are two in number in each jaw, but in some few, forming the family *Leporidæ*, there are four of these teeth in the upper jaw; the superadded pair, however, are small, and hidden behind the principal pair. They are long, curved, and more or less cylindrical, but often their depth is greater than their width, and the sides are somewhat flattened: such is the case in most of the species of the

Squirrel and Rat families. Sometimes the width of the incisor is very great, and exceeds the depth; the Rodents, which burrow, and live almost entirely under ground, present this form of incisors; these powerful teeth being no doubt used to gnaw through the roots, which would otherwise obstruct their subterranean course. Other modifications in the form of the incisor teeth will be hereafter pointed out in the descriptions of the various species; I shall merely here observe, that those of the upper jaw are always shorter than those of the lower, and usually describe about three parts of a circle. The longer incisors of the lower jaw form a smaller segment of a larger circle.

Owing to the unequal density of different parts of the incisor teeth, the wear by their mutual attrition is unequal; the softer hinder part wears most rapidly, and the hard enamel in front least so; hence a sloping, chisel-like edge is always preserved. In proportion as the exposed end of the incisor is thus worn, additional dentary matter being supplied to the tooth, it continues to grow from the base, and thus preserves an uniform size.

As not only the sharp edge of the Rodent's incisor, but likewise the proper length of the tooth, is maintained by the constant attrition of an opposing incisor, should one of these teeth receive an injury, and be thrown out of its proper direction, the tooth which it should be opposed to will continue to grow, and retaining the curve given to it by the form of the socket in which it is implanted, will sometimes describe a complete circle: the power of mastication is destroyed, and the death of the animal necessarily ensues[1].

[1] Prof. Owen, in the 104th plate of his Odontography, has figured the upper jaw of a Rabbit in which, from some such cause, one of the upper incisors has assumed an unnatural length; its recurved point penetrates the upper jaw. The same author also calls attention to a lower jaw of a Beaver, preserved in the Museum of the College of Surgeons, in which, from un-

Eight is the smallest number of molar teeth found in any animal of the present group, and that occurs only in one species — the Hydromys of Australia; $\frac{3-3}{3-3}$ is the normal, though not constant number, in a very extensive section (the *Muridæ*), and $\frac{4-4}{4-4}$ is the constant dental formula of another large section (*Hystricidæ*): this number is exceeded in most of the species of the Squirrel family (*Sciuridæ*), where there is an extra small tooth in front of each row in the upper jaw, making $\frac{5-5}{4-4}$; and the highest number of molars is found in the Hare section, where the molars are $\frac{6-6}{5-5}$. The teeth under consideration are rooted, or rootless; in the former case, as the roots are formed by the decrease in the quantity of dental pulp —sudden at first, immediately after the formation of the body of the tooth, and gradual afterwards, when it is supplied only from certain points determining the number of fangs—they discontinue growing after a certain period; when, in fact, the animal has attained maturity; but in the latter case the molar teeth, like the incisors, continue to grow at the root in proportion as they wear at the opposite extremity.

The molars are composed of three substances of different degrees of density, of which the chief are called dentine and enamel: the dentine forms the main portion of the tooth, whilst the enamel, a much harder substance, sometimes merely forms an outer layer; but in most Rodents it likewise forms loops or folds, which penetrate deeply into the body of the tooth. External to the enamel is the third substance— cement, which enters very little into the structure of the rooted molar, but in the rootless, forms an important part, filling the interstices of the folds of enamel, and sometimes

checked growth, the incisor has described a complete circle, and in its course has passed through the masseter muscle, and entered the back part of the mouth.—Odontography, p. 411.

serving to tie together the different parts of a tooth where it is completely subdivided by the enamel, as in the molars of the Capybara.

The enamel being harder than the other two substances of which the tooth is composed, wears less rapidly, and presents sharp ridges on the crown of the tooth, which for the most part have a nearly transverse direction, whilst, as has been pointed out by Cuvier, in connection with this structure, the motions of the lower jaw are longitudinal. The patterns formed by the folds of enamel are very variable, and have been seized upon by mammalogists to assist in defining the minor groups of the order. Very frequently there are two principal folds indenting the outer side of the upper molars, and one on the inner; and the lower molars present the opposite condition in this respect. The Rodentia agree with most other placental Mammalia in never having more than three true molars on either side of each jaw; for where the series is composed of more than three, it is found that the additional teeth are pre-molars, having replaced deciduous, or milk teeth. In some species the deciduous teeth are shed before birth, as in the Guinea-pig; in the Hares they are shed when the animal is about eighteen days old, whilst in the Beaver I have found the milk tooth, which is afterwards replaced by the foremost of the four permanent molars, in the skull of an animal which was about half grown.

Deciduous incisors have not hitherto been detected in animals of the group under consideration, excepting in the Hares and Rabbits[1], in which, a few days after birth, six incisors are found in the upper jaw: they are small and pointed, and packed closely together, so as to form two longitudinal series: of these, four are deciduous, the anterior pair only

[1] I have sought in vain for deciduous incisors in young *Marsupialia*; if they exist, they must be shed at a very early period in these animals.

being permanent. In the lower jaw the two permanent incisors only are found.

The intestinal canal, in most Rodents, is very long, and the division of large and small intestines is marked by the presence of a cœcum, which is often very voluminous, and more or less divided into cells by internal septa: it is largest in those species which have rootless molars, and is of moderate size, and more simple in form, in the Rats, which subsist less exclusively upon vegetable substances, and have rooted, tubercular molars. In one small group, the *Myoxina*, or Dormouse section, the cœcum is entirely wanting, and here, moreover, the intestinal canal is very short. In most Mammalia the small intestines greatly exceed the large in length: the difference, however, is less marked in the herbivorous section; and in the division which now occupies our attention we find the small intestines occasionally even surpassed in length by the large, and, as a general rule, not only is the difference of length of the two divisions of the canal less than other Mammals, but the large intestines do not retain the character from which they derived their name, that of having a greater diameter than the small intestines: if we except a short dilated portion which joins the cœcum, they scarcely exceed the small in diameter.

The stomach varies much in its general contour in the Rodentia, but its transverse almost invariably exceeds its vertical diameter; the œsophagus usually enters near the middle of the upper, or concave surface; the left, or cardiac portion, is sometimes nearly globular, but most frequently ovate, or nearly conical, and is strongly recurved. The pyloric portion is generally much inflated, and separated from the cardiac half, by a more or less strongly marked constriction; its parietes are thicker, and more muscular than those of the cardiac, which are clothed with an epidermis. The two

halves of the stomach are in general nearly equal in calibre. In the definition of the order I have already alluded to a very characteristic feature in the skull of the Rodent—the longitudinal direction of the glenoid cavity. The frequent occurrence of a distinct interparietal bone, even in the adult animals of this order, the great development of the intermaxillary bones, and the large size which the ant-orbital opening often attains, are other points which must not remain unnoticed in connection with the skull. The eye cavities are lateral, often very large, and are never perfectly separated from the temporal fossæ: these latter are in many species of the group very small, especially in those which have a large ant-orbital opening[1].

The usual number of dorsal vertebræ is thirteen, but in many species there are twelve; some few have as many as fourteen, and in the Prehensile-tailed Porcupine there are sixteen. Of lumbar vertebræ, six is the most common number, but seven not unfrequently are found, and five occur in some few species. Many Rodents have three sacral vertebræ; five, and two occur, but are very rare, whilst four is the most frequent number. Nearly all Rodents are claviculated; in the Hares, however, the clavicles are very small, and the Cavies form an exception to the general rule, in being destitute of clavicles. The bones of the forearm are applied closely together, but rarely anchylosed. I have seen them partially anchylosed in the skeleton of the Paca (*Cœlogenys Paca*); and, in a skeleton of a small species of Sciuropterus,

[1] Of the peculiarities of the skull and skeleton presented by the different subdivisions of the present order, we shall have to speak hereafter (as well indeed as of other parts), in conjunction with the classification of the group, which it will be most convenient to take into consideration when the plates are before the reader, and can be referred to in illustration of the points advanced. The geographical distribution of the order will at the same time be treated of.

in the College of Surgeons, these two bones are perfectly joined at the lower extremity, as are the tibia and fibula in the same animal. The fore foot is almost always provided with four well-developed toes, and a rudimentary inner toe or thumb. Excepting in the Hare tribe and the Cavies, the fore-foot is used, like a hand, to convey food to the mouth. All the ordinary bones of the wrist are distinct, and the os magnum is generally divided.

The tibia and fibula are distinct bones in very many Rodents, but in the whole of the *Muridæ* and *Leporidæ* the latter bone is joined to the former, so that the two bones appear to form but one on the lower half of the shank. In the Cavies, Agoutis, and Gerboas (*Dipus*, as now restricted[1]), the hind foot is provided with but three toes; some few Rodents have four, but usually five toes are present. The *os naviculare* is often divided, and a supernumerary bone is very frequently met with on the inner side of the tarsus joining the os naviculare.

The structure of the terminal part of the muzzle offers some well-marked characters in the different sections of Rodents, but unfortunately the stuffed specimens in museums present a condition very unfavourable for the examination of this part: having, however, drawings and notes of the part in question of many species, taken from the animals immediately after death, or from specimens preserved in spirits, I will here point out some of the leading modifications.

A distinctly cleft upper lip, combined with a small naked muffle, divided by a vertical groove, and separating the nostrils, is characteristic of nearly the whole of the great Murin and Sciurine sections[2]. In these animals the nostril open-

[1] The three metatarsals, which bear the toes, are united in this genus into one bone, having three articular surfaces at its distal extremity.

[2] I speak of these sections as they have been defined by myself in the Magazine of Natural History, and in the Annals of Natural History.

ings are lateral, rounded in front, suddenly contracted behind the rounded part by a descending fleshy lobe, and as they run backwards they curve upwards: they are, in fact, shaped like a comma. In several species of both these groups I have observed a ridge or fold crossing the naked part of the muffle from the upper angles of the nostrils, and where this fold occurs it indicates that the animals have the power of drawing the skin of the hairy upper portion of the muzzle down over the naked portion: such I know to be the case in many Squirrels and Rats, as well as in the Gerbilli and Gerboas. When the skin of the muzzle is folded over, the nostrils are closed, and the naked and sensitive portion of the muffle protected. The principal exceptions which I have noticed occur in the *Saccomyina*[1], where the upper lip is not cleft, presenting only a small notch immediately above the incisors. The same structure is observable likewise in the genus *Hydromys*; and in some of the *Arvicolina* the upper lip is also but partially cleft The next modification in the muzzle is presented by the Hystricine division of Rodents. The common character of this group is to have an obtuse muzzle, the nostrils linear, and forming a slight S-like curve, and the muffle clothed (often rather sparingly) with fine velvet-like hairs. The upper lip is rarely cleft, and there is very seldom any groove between the nostrils. Sometimes the nostrils are nearly round, but run into a point above; the muzzle recurved, enormously swollen, and covered through-

[1] A group of Rodents found in North, and Central America, and in some of the West India Islands, all the species of which possess cheek pouches, opening externally: they have $\frac{4-4}{4-4}$ molar teeth. In some the teeth are rootless, and the tail is short; they constitute the genus *Geomys*; in others the tail is long, and the molars are rooted, as in the genera *Heteromys*, *Saccomys*, and *Perognathus*. *Dipodomys* no doubt also belongs to this section, which I provisionally form for genera which there appear to be good reasons thus to unite.

out with velvet-like hairs; no groove separates the nostrils, and the upper lip is merely notched at the margin. The Prehensile-tailed Porcupine (*Hystrix prehensilis*, Linn.) presents this structure of muzzle[1]. With the muffle similarly clothed with hairs, and destitute of vertical groove, I find the nostril openings assuming a nearly linear form, and a cleft upper lip, in the Fasciculated Porcupine of Africa (*Atherura Africana*, Gray). In the Hares the muffle is hidden by the folding over of the skin of the muzzle, and the upper lip is cleft. The Cavies approach the Hares most nearly in the structure of the muzzle, but they retain the common (I do not say constant) character of the Hystricine group, in having the upper lip entire.

In many Rodents the hairy upper lip laps over the anterior palatal portion of the mouth.

LEPORIDÆ, or Hare Family.

Rodents, with incisors, $\frac{4}{2}$, and rootless molars, $\frac{6-6}{5-5}$ or $\frac{5-5}{5-5}$; skull with the two optic foramina united.

The Hare section is less numerous in species than other families of Rodents, and offers many exceptions to the general, or normal, characters of the order. The large size of the openings in the skull, combined with a very imperfect condition of the palate; the perforations in the nasal process of the superior maxillary bone, large orbits meeting in the mesial line of the cranium, the small temporal fossæ,

[1] When the animal is alive this great fleshy muzzle is constantly in motion. I may observe, there is a great tendency *generally* in the Hystricine group to this incrassated form of muzzle.

and the increased number of incisor and molar teeth, are among the more striking characters presented by the skull. The extra pair of incisors in the upper jaw are small, and placed behind the principal pair, and these latter are grooved in front. The incisors, both of the upper and under jaw, are shorter, *i.e.* less deeply implanted in the jaw than in other Rodents, and they are always white. The molar teeth are always rootless.

The stomach is simple, or partially divided internally; the cœcum, which is very long, is divided into numerous cells by tendinous bands, the partitions being indicated externally by a corresponding number of constrictions: similar constrictions are observable on the first part of the colon, but the colon soon contracts to a diameter which is nearly equal to that of the small intestines. At the point of junction of these latter with the cœcum, is a small glandular cul-de-sac.

The spine of the blade-bone, or scapula, terminates in a moderately long acromion process, which, near its extremity, sends down a long branch at right angles with the spine. The fore feet are provided with five well-developed toes, and the hind feet with four. At the lower half of the shank the two bones (tibia and fibula) are always anchylosed.

The inner surface of the cheeks is clothed with small hairs; at least, there is a moderately broad band of skin which is thus clothed, running backwards from the angle of the mouth. The tail is either short and bushy, and carried erect, or exists only in a rudimentary condition.

Examples of this family are found both in the Old and New World, but they are chiefly confined to the northern hemisphere; some, like the *Lepus glacialis*, extend into the polar regions. About 35° S. Lat. is the most southern range of the family in either hemisphere. The great continent of South America has yielded but a single species, and

that does not occur south of the Rio de la Plata, whilst, on the other hand, it is in North America (extent of territory being considered) that the species are proportionately most numerous. In the Old World, the group, in like manner, almost disappears in the tropical portions; it reappears, however, south of the tropics, there being several species found at the Cape of Good Hope. But one species has been discovered in the Indian Islands[1], and in Australia there are no Hares; indeed, all the Rodentia found in that continent belong to the family *Muridæ*.

Fossil remains of the present family occur only in the newer tertiary deposits, and are referrible to the same genera as the existing species.

The family *Leporidæ* is composed of two genera only; one of them constitutes Cuvier's

Genus, *Lagomys*.

Leporidæ, with no visible tail, short and rounded ears, short hind legs, and molars, $\frac{5-5}{5-5}$.

The tailless Hares, or Pikas, as the animals of this division have been called, are of small size, the largest not exceeding the Common Guinea-pig in bulk. To Pallas we are indebted for the first account of certain members of this genus, discovered by him in his travels in Central Asia, one of which has since been found to extend into Europe, occurring in the southern districts of the Volga. A new species of the group was discovered by Dr. Richardson in the Rocky Moun-

[1] Of these islands it is in Java only that any Hare has been found, and that is specifically identical with an animal inhabiting continental India, and which occurs likewise in the Mauritius.

tains of North America, and more recently several species of Pikas have been found in the Himalayas.

Although in certain spots the Pikas are found in considerable numbers, they do not appear to be, strictly speaking, gregarious. They occur only in alpine or sub-alpine districts, where they form burrows in the ground, or sometimes take shelter amongst the loose stones. Occasionally, when the weather is cloudy, they will quit these retreats in quest of food during the day, but the night is their ordinary time of feeding. Their food consists of various kinds of herbage, and, as in the high and cold regions which they inhabit, the herbage is covered with snow during the winter months, they must then starve, were it not that their instincts lead them to lay up a stock for this season. Large quantities of dried grasses, and other vegetable productions, are collected by the Pikas for their winter's consumption; these they pile up during the autumn, like small hay-stacks, which gradually disappear as the spring approaches, unless, as not unfrequently happens, these stores are robbed by the sable-hunters to feed their horses.

The Pikas, when feeding, frequently utter a chirping or whistling noise: in the *Lagomys pusillus* the sound is said to resemble the call of a Quail, and to be remarkably loud for so small an animal.

Beyond the chief distinguishing characters of the genus *Lagomys*, already pointed out, there are others which are worthy of notice, more especially in the structure of the skull. Upon comparing the skull of a Pika with that of a Hare[1], the most striking differences are the depressed form of the former; its being more dilated behind, the contracted interorbital space, and absence of supra-orbital process, the upward direction of the orbits, the great prolongation of the

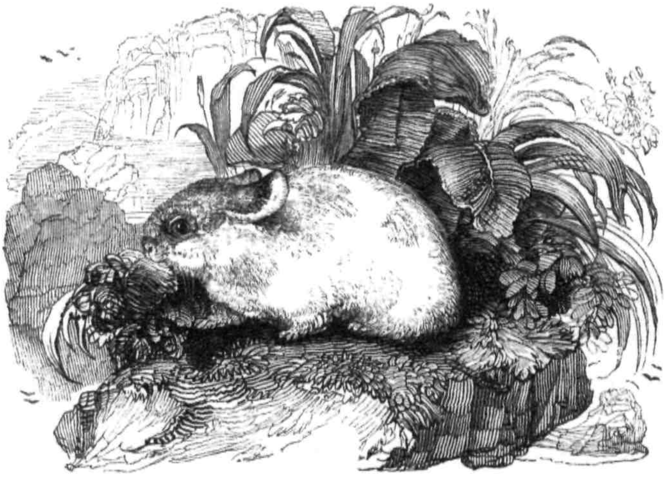
[1] See Plate 2.

malar bone beyond the zygomatic process of the temporal, extending backwards, as it does, nearly to the opening of the ear-chamber. In lieu of the numerous perforations found in the nasal process of the superior maxillary bone of the Hares, there is but one chief opening in the same bone of the *Lagomys*[1]. Viewing the palatal portion of the skull of the *Lagomys*, we find that, owing to the depressed form of the cranium, the bodies of the sphenoids and the vomer are brought nearer to the plane of the palate than in the true Hares. The posterior sphenoid wants the mesial perforation, and the openings on either side of this bone are smaller; the vomer, moreover, joins the anterior sphenoid, whilst in the Hare an oblong opening separates the bodies of these two bones; the incisive openings are sometimes separated from the middle or chief palatine openings, but in some of the Pikas the openings are confluent, as in the true Hares. The occiput is broader than high, and the zygomatic arch is remarkably short. In the lower jaw (Plate 2, fig. 1. *b.*), the chief differences consist in the smaller antero-posterior diameter of the angular portion, and in the condyloid portion being sloped less backwards: the long thin plate representing the coronoid process in the true Hares, is in the Pikas replaced by a small tubercle, and there is a second, still smaller tubercle, placed below the one just mentioned, and, in fact, but little removed from the posterior molar teeth. The situation of the mental foramen is remarkable, since, instead of being placed in the fore part of the jaw, we here find it near the middle of the outer surface of the horizontal ramus.

The principal incisor teeth of the upper jaw are broad, but have a very small antero-posterior diameter; each of these teeth has a deep vertical groove on the outer side, and ter-

[1] A small bony branch sometimes crosses this opening—perhaps it is constant, but has been destroyed in some of the crania before me.

minates in two points, there being a strong notch at the extremity. The lower incisors are simple, and smaller than the upper. The upper molars can scarcely be said to differ in their structure from those of the true Hares; they present the same three transverse ridges of enamel, but on the hinder part of the last molar a small extra loop is visible—it is placed nearer to the inner, than to the outer angle of the tooth: this molar corresponds to the penultimate molar in the Hare's skull. The molar teeth in the lower jaw differ from the corresponding teeth in the Hares, in having the groove on the outer, as well as that on the inner surface, more deep; the body of the tooth is therefore more contracted in the middle, and the salient angles of the two halves of the tooth are more prominent; the foremost molar, as in the Hares, has two grooves on the outer surface; the last molar has but one salient external and internal angle, and in bulk does not equal half of one of the preceding molars. Small naked pads at the ends of the toes have been noticed amongst the characters which distinguish the Pikas from the Hares; these pads are generally distinct, but in two species (*L. pusillus* and *L. Ogotona*) they are exceedingly small, and can scarcely be traced; excepting these pads, the soles of the feet are throughout densely clothed with fur.



LAGOMYS ALPINUS.

Alpine Lagomys.

Lepus alpinus	PALLAS, Novæ Species Quadrupedum e Glirium Ordine, p. 52, Pl. 2. 1778.—Reise durch verschiedene Provinzen des Russischen Reiches, tom. ii. p. 701, Tab. A. 1773.
" "	SCHREBER, Säugthiere, iv p. 911, Tab. 238.
Lagomys alpinus.	CUVIER, Règne Animale (ed. 1829), i. p. 219.

General hue of the upper parts grey-brown, of the under parts grey, tinted with yellow; feet pale, suffused with brownish yellow; ears with dirty yellowish white hairs internally, dusky towards the margin, and with the margin white.

The Alpine Lagomys, or Pika, inhabits Siberia, from the River Irtish eastwards, and is said to extend into Kamtschatka. Its fur is long and soft, and of a deep grey hue next the skin; on the upper parts of the body the hairs have a whitish ring beyond the middle, and from this part they become

gradually darker to the point, first passing into brownish yellow, and then into black; on the sides of the body the brownish yellow hue is more conspicuous than on the back, for here the black is less extended on the exposed ends of the hairs. The hairs on the under parts of the body are of a yellow hue at the point, but the deep grey colour of the lower part of each hair is not entirely hidden when the fur is in its ordinary condition, and hence the general tint of these parts is greyish yellow. Over the hinder part of the haunches, and on the sides of the chest, the fur assumes a richer hue than elsewhere, being much suffused with rusty yellow. The dense fur on the soles of the feet is brown. The hairs of the moustaches are exceedingly long, and of a black hue. The ears are large and rounded, and clothed with dusky black hairs externally, excepting at the base, where they are greyish; on the inner side they are of a dirty yellowish white colour, but tipped with blackish; remote from the margin they are almost entirely white, but towards the margin the dark hue prevails; the margin itself is dirty white, but the pale edge is very narrow.

	British Museum.		From Pallas.	
	Inches.	Lines.	Inches.	Lines.
Total length	8	9	9	7
Length of ear	0	10	1	0
Width of ditto	0	11½	1	0½
Length of fore foot and nails ...	0	9½		10
" of hind foot and nails ...	1	5	1	5

The dimensions in the second column, taken from Pallas's account of *L. alpinus*, are, I do not doubt, from a fresh specimen, and more accurate than those contained in the first column, which are from a stuffed specimen in the British Museum—the original of my description. In the British Museum collection is a second specimen, which is entirely black; the skull, which has been removed from this latter

animal, agrees very closely with Pallas' figure of the skull of *L. alpinus*. The skull (Pl. 2, fig. 1) is larger than that of other species of the genus; the interorbital portion of the cranium is broader than in the skull of *L. Ogotona* (which approaches it most nearly in size); the orbital fossæ are much smaller; the principal palatal opening, which is very broad, is not so long, and the incisive opening is separated by a long interval from the principal opening by the uniting of the superior maxillary bones in the mesial line; the lateral opening in the superior maxillary bone is smaller. The condyloid portion of the lower jaw, though not higher, has a considerably greater transverse diameter than the corresponding part of the lower jaw of *L. Ogotona*; the angle of the jaw, moreover, is less recurved.

LAGOMYS OGOTONA.

Ogotona Lagomys.

Lepus Ogotona.	PALLAS, Nov. Spe. Glir. p. 64, Pl. 3.
" "	SCHREBER, Säugthiere, iv. p. 915, Pl. 239.
Lagomys Ogotona.	CUVIER, Règne Animal, p. 219.

Ears and feet very densely clothed with fur: upper parts of the body of a pale ashy grey, with a slight admixture of yellow; feet, ears, and under parts of the body, white, tinted with cream-colour, or pale yellow.

Inhabits the subalpine districts beyond Lake Baikal, as well as of the Daurien, and the Mongolean Desert, and extending into China.

The fur of this animal is long, very soft, and of a deep grey colour next the skin: on the upper parts of the body the hairs are yellowish white, or cream-coloured, near the

point, and grey, or some of them, black, at the point; the dark grey hue of the inner parts of the hairs is completely hidden by the pale terminal part, which is chiefly of a cream colour, but the extreme points of the hairs being dusky, the mixture produces an ashy grey hue; on the sides of the body the hairs are less distinctly tipped with dusky, and here a yellowish cream colour predominates: two very large patches behind the ears are of the same tint; the hinder parts of the haunches are slightly suffused with rufous; the under parts of the body are cream colour, and so are the feet, but the toes are white, and the under surface of the hind foot is brown. The ears are densely clothed with long hairs, and these are for the most part of an uniform white; those covering the fore part of the outer surface, however, are somewhat dusky, and the extreme points of many of the hairs on the inner surface of the ear are likewise dusky, more especially those near the margin.

The above description is taken from a specimen in the British Museum collection: the skull resembles that represented by Pallas of his *L. Ogotona*, not only in size, but in having the interorbital portion elevated; this part is much more contracted than in other species of Lagomys I am acquainted with. The superior maxillary bones do not quite meet in the mesial line, so as to separate the incisive opening from the principal palatal opening.

	Brit. Museum. Inches.	Lines.
Total length	8	0
Length of ear		8¾
Width of ditto	1	0
Length of fore foot		11
" of hind foot	1	5½

LAGOMYS PUSILLUS.

Pigmy Lagomys, or Sulgan.

(*Plate* 1, Fig. 2.)

Lepus pusillus.	PALLAS, Nov. Comm. Petrop. xiii. p. 531, Pl. 14, f. 1; Nov. Spec. Glir. p. 37, Pl. 1.
" "	SCHREB., Säugthiere, iv. p. 906, Pl. 237.
Lagomys pusillus.	DESM. Mammalogie, p. 353.
" "	CUVIER, Règne Animal, p. 219.

General tint brown, the fur rather strongly pencilled with black and brownish yellow; feet and under parts yellow-white; ears small and rounded, with a distinct white margin, and internally with a submarginal black band, within which the hairs are yellow.

Inhabits the southern districts of the Volga, and the southern portions of the Ouralian Mountains, and occurs likewise in South Siberia, extending eastward to the River Obi.

Lagomys pusillus may be distinguished from the two preceding species (*L. Ogotona* and *L. alpinus*), by its smaller size, and, from these and other species described, in having the ears proportionately smaller, with a broader white margin, and with a distinct submarginal black band on the inner surface: the dark band, however, is confined to the hinder and lower parts of the ear: within the dark band the hairs assume a rich yellow hue: externally the ears are black in front, and grey on the hinder part, where the hairs are very long. The general brown tint of the upper parts of the body is produced by the mixture of black and brownish yellow, the hairs being annulated towards the point with the latter colour, and black at the point: next the skin they

assume a blackish grey hue; on the under parts of the body the deep grey hue is but partially hidden by the overlapping pale yellowish points of the hairs. The feet are nearly white above, but slightly tinted with yellow; the dense fur on their under surface is dusky brown. Naked pads beneath the toe-nails can scarcely be said to exist, or at least they are smaller than in other species, if we except the *L. Ogotona*.

The foregoing description is from a specimen in the British Museum, the dimensions of which agree very closely with those given by Pallas, some of which I have added in the second of the subjoined columns.

	British Museum.		From Pallas.	
	Inches.	Lines.	Inches.	Lines.
Total length	7	0	6	9
Ear		8½		9
Fore foot and nails		8		8
Hind foot and nails	1	1½	1	1

The skull of *L. pusillus* agrees with that of *L. alpinus* in being comparatively broad between the orbits—much broader and more depressed at this part than in *L. Ogotona*. In the form of the nasal bones it differs from both species, inasmuch as these bones are as broad behind as in front (or very nearly so); the skull is considerably smaller than in either of the species just mentioned, and the lateral openings in the superior maxillary bones are larger. The incisive and principal palatine openings are confluent, and the angle of the lower jaw is very little recurved.

LAGOMYS RUFESCENS.

Rufous Lagomys.

Lagomys rufescens. Gray, Annals and Magazine of Nat. Hist. No. 65 (vol. x.), December, 1842, p. 266.

General hue pale sandy red, darker on the upper surface of the head, as well as on the shoulders and fore part of the back;

two very large patches behind the ears, the feet, and the under parts of the body, are of a pale buff yellow: ears moderately large, subovate, and well clothed with hairs; rusty yellow on the inner surface, as well as on the fore part of the outer surface, but pale buff yellow on the under part: soles of the feet obscurely suffused with rufous.

Inhabits the Rocky Hills of Cabul.

The hairs of the fur of this animal are of a dark slate-grey colour, tipped with pale yellow on the under parts of the body, and on the upper parts they are broadly ringed with pale rufous near the point, and black, or dusky, at the point. The large pale patches behind the ears are formed of hairs which differ from those of other parts of the body in having the grey occupying but a small part of their extent, being chiefly confined to the root. The hairs of the moustaches are very long, and for the most part brown; some few are brown-white. The toes, both of fore and hind feet, are terminated with distinct naked pads of a blackish colour.

	Inches.	Lines.	Inches.	Lines.
Total length	8	0	7	0
Length of ear		8½		8
Width of ditto		9		9
Length of fore foot and nails		10½		9½
" of hind foot and nails	1	5	1	3½

The skull of *Lagomys rufescens* is considerably broader than that of *L. nepalensis*; it has the nasal bones narrower, and distinctly contracted behind, whilst in the Nepal animal, the nasal bones are nearly as broad behind as in front; the interorbital space is narrower, and there is a marked difference in the palatine openings, as I have pointed out in the account of *L. nepalensis*. The only skull of *L. rufescens* which I have had an opportunity of examining[1] is imperfect, wanting

[1] This skull was removed from the smaller specimen referred to in my description, the dimensions of which are given in the second column.

the hinder parts; the existing parts are larger than in *L. nepalensis*, and smaller than in *L. Ogotona*, and, if the skull were perfect, its entire length, no doubt, would be very nearly 1¾ inches. Although narrower between the orbits than in *L. nepalensis*, this part is not so contracted as in *L. Ogotona*: the lateral openings in the nasal portion of the superior maxillary bones are distinctly smaller than in the skull of either of the animals just mentioned.

The above description is taken from one of two specimens in the British Museum; the second specimen is smaller, and differs somewhat in its colouring, having the back of a sandy hue, very obscurely tinted with rufous, and finely pencilled with brown, and the whole of the back of the neck yellowish white. Other specimens are contained in the museum of the India House, having been sent by Dr. Griffith, who states that the animal is "not uncommom in rocky grounds about Cabool, and perhaps generally between an elevation of 6,000 or 8,000 feet[1]."

Mr. Blyth, speaking of a species of Lagomys found in the western part of the Himalaya district (the *L. Hodgsonii*), states that it is probably the same as the small species noticed by Capt. Thomas Hutton in Afghanistan; this latter is, no doubt, the animal just described, and, upon comparing it with Mr. Blyth's description of his *Hodgsonii*, it would appear to differ in its general colouring being paler, and in having either the whole, or the greater part, of the back of the neck of a yellowish white tint; the superior breadth of the skull, moreover, would distinguish the *L. rufescens* from the *L. Hodgsonii*: on the other hand, the skull of Mr. Blyth's animal, judging from the figures and dimensions given, agrees

[1] See Dr. Griffith's Report in the tenth volume of the Journal of the Asiatic Society of Bengal.

most closely with that of the *L. nepalensis*, and, as in the description of its colouring I can perceive no important point of distinction, I am strongly inclined to believe the two are specifically identical. The principal characters of Mr. Blyth's species I shall proceed to extract from that gentleman's account.

Lagomys Hodgsonii.

Lagomys Hodgsonii. Blyth, Journal of the Asiatic Society of Bengal (1841), vol. x. p. 816, and Plate at p. 854.

General colouring nearly resembling that of the Common Water-Rat, having a distinct rufous tint; the longer hairs of the fur, which are three-quarters of an inch in length, have the basal half, or rather more, of a slaty black colour; above this they are first pale brown, then rufous brown, and, finally, at the point, they are dusky; the under parts are of a dirty white hue; the feet brown, with a faint tinge of rufous on the upper surface; the ears are of a rounded oval form, nearly naked externally, but with a narrowish border of brown hairs on the fore part; internally there is likewise a border of brown hairs, but this is comparatively broad; the margin is obscurely fringed with white: upper surface of the head, and the region of the shoulders, of a richer rufous tint than other parts.

This species is said to be common in Lahoul, Ladakh, and Kooloo.

	Inches.	Lines.
Total length	6	0
Hind foot and nails	1	3
Length of ear		10¼
Width of ditto		9
Length of skull	1	7½
Width of ditto		10½
From front of palate to inferior margin of occipital opening		10½ (nearly)
Height of cranium, with the lower jaw *in situ*	0	13½

LAGOMYS NEPALENSIS.

The Nepal Lagomys.

Lagomys nepalensis. HODGSON, Journal of the Asiatic Society of Bengal (1841), vol. x. p. 854, and Plate at p. 816.—Annals and Mag. of Nat. Hist. for Sept. 1842, vol. x. p. 76.

Fur very soft, that on the head and fore parts of the body of a rich chestnut red, on the back brown, and on abdomen white, more or less suffused with rufous or pale chestnut; feet whitish, tinted with rufous above; ears rather large, brownish internally, and with an indistinct pale margin; a whitish patch behind each ear.

Inhabits the northern hilly districts of Nepal, and Mr. Hodgson is informed that the species is likewise found in Thibet.

The skull of *L. nepalensis*, like that of *L. pusillus*, has a comparatively broad interorbital space, and the nasal bones are of very nearly equal width throughout; but these bones are longer than in *L. pusillus*. The most marked difference existing between the skull of the Nepal Lagomys and that of the *L. pusillus* (or, indeed, of that of any other species which I have examined), consists in the perfect confluence of the incisive and principal palatine openings, a character which approximates the Nepal Pika more nearly to the true Hares. In *L. alpinus* the superior maxillary bones unite so as to separate the two openings in question by a longish space, and in other species of *L. Lagomys* the same bones are approximated more or less closely: in *L. Ogotona* they nearly meet, and in *L. pusillus* and *L. rufescens*, though they are more distinctly separated, and the two openings are more confluent, yet there is a decided contraction between them, serving to mark their natural boundaries, whilst in *L. nepalensis* no

contraction at the part in question exists; there is but one large opening, commencing close behind the incisive teeth, where it is very narrow, and becoming gradually broader to its termination, which is in a line with the space between the second and third molars. The groove in the upper incisor teeth is rather broader than usual.

Beyond the distinctions furnished by the structure of the skull, the *L. nepalensis* differs from other species in having the head and fore parts of the body of a deep and rich chestnut red. In *L. rufescens* the top of the head, and the shoulders, are reddish, but paler than in the Nepal animal, which has but a small pale patch behind each ear. The fur on the back has a general brownish hue, but it is rather distinctly pencilled with black, and pale yellowish brown, the hairs (which are as usual of a deep slate-grey for more than half their length), being annulated with the pale colour towards the point, and black at the point. On the under parts of the body the dark grey of the inner part of the fur is but partially hidden by the pale points of the hairs; they are either tipped with yellowish white, or pale chestnut red; on the chest the latter colour is distinct. The ears are moderately well clothed with short hairs[1], the general hue of which is brown on the inner surface; and on the outer they are nearly black on the fore part, and pale on the hinder: these organs are large and of a rounded form; they are rather broader than in *L. rufescens*. The toes are terminated with distinct naked pads, and there is a small naked tubercle on the under side of the wrist. The dense fur on the under surface of the feet is of a dusky brown hue.

[1] Mr. Hodgson states that the ears are "nearly nude, except on the anterior and incurved edge of the helix, where very short hairs are pretty closely set." This descriprion agrees with one only of several specimens in Mr. Hodgson's collection which I have examined, and in that it appears to me the hairs have been rubbed off of the ears.

	British Museum.		Leyden Museum.	
	Inches.	Lines.	Inches.	Lines.
Total length	8	0	7	6
Length of the ear		8¾		8½
Width of ditto		11½		9½
Length of fore foot and nails, about		19		10
" of hind foot and nails ...	1	4	1	3½

LAGOMYS ROYLII.

Royle's Lagomys.

Lagomys Roylii. OGILBY, Memoir on the Mammalogy of the Himalayas, in Royle's Illustrations of the Botany, &c. of the Himalayan Mountains, p. lxix, Pl. 4.[1] 4to. London, 1839.

" " IS. GEOFFROY, in the Voyage dans l'Inde, par Jacquemont, Mammifères, p. 62.

General hue of the fur greyish brown ; on the under parts of the body dirty white, tinted with yellow : ears small and rounded, with a very narrow pale margin.

The specimen upon which Mr. Ogilby founded the *L. Roylii* was discovered by Mr. Royle in the Choor Mountain, at an elevation of 11,500 feet, and, according to M. Jacquemont, the same species is likewise found in the valley of the Yurpo, and in Cashmere, in the high valley where the Sind and Gombur divide.

The *Lagomys Roylii* most nearly resembles the *L. pusillus*, having the same small and rounded ears, but these organs have but an indistinct narrow margin, and they want the decided black mark on the inner surface. The comparatively small size of its ears, and the total absence of any rufous colouring about the head and shoulders, at once dis-

[1] The animal is here named *Lagomys alpinus*, a mistake which no doubt gave rise to the statement made by Dr. Wagner (Schreb. Säug. Suppl. iv. p. 120), that the *L. alpinus* is found on the Choor Mountain.

tinguish it from the other species of Northern India. The fur of the present animal, although soft, is rather less so than in the *L. nepalensis*; as in other species, it is of a deep slate-grey hue next the skin. On the upper parts of the body the hairs have a whitish ring towards the point, are black at the point, and between the white and black parts they assume a brownish yellow colour; the mixture of these colours produces a general hue, which may be described as greyish brown. On the under parts of the body the hairs are tipped with very pale yellow. The ears have the usual dusky patch on the fore part of the external surface, and internally they are tolerably well clothed with brownish hairs, which are dark towards the margin, and become paler more remote from that part; the margin of the ear is very narrowly edged with dirty white. The toes of the fore foot terminate with distinct naked pads, and there is a small naked tubercle on the under surface of the wrist. The hind feet are wanting in the specimen before me, which is likewise the original of Mr. Ogilby's description. The length of the skin, which is partially stuffed, and in bad condition, is 8 inches; of the ear, $\frac{7}{12}$ths of in inch, and of the fore foot, $9\frac{2}{3}$ lines.

The skull, according to the figure in Dr. Royle's work, is about equal in size to that of *Lagomys nepalensis*; its upper surface, it would appear, is more arched, and the palatine opening smaller; the incisive opening is confluent with the principal opening, and the figure does not represent the sudden contraction of the fore part of the great opening formed by the junction of the two foramina mentioned, in which respect the skull of *L. Roylii* presents a marked difference when compared with that of *L. pusillus*.

On the whole, the materials at my disposal, as it appears to me, fully justify the conclusion that there are three distinct species of *Lagomys* in the northern parts of India, and that

these species are neither of them identical with either of the three Russian species described by Pallas in his "Glires."

LAGOMYS PRINCEPS.

The Rocky Mountain Lagomys.

Lepus (Lagomys) princeps. RICHARDSON, Zoological Journal, No. 12, p. 520, March, 1828.—Fauna Boreali Americana, p. 227, Pl. 19. 1829.

General hue of the fur on the upper parts of the body greyish, but these parts are strongly pencilled with black and yellowish white; on the sides of the body yellowish brown, and on the under parts dirty white, considerably suffused with pale brown-yellow; feet white, tinted with yellow on the upper surface; ears rather large, with a distinct white margin.

Dr. Richardson has been enabled to trace this little animal, known as the "Little Chief Hare," along the Rocky Mountains, from the 52d to the 60th parallel of latitude, and we learn from Dr. Bachman that it has a still more extensive range on this great North American chain, it having been found by Mr. Nuttall as low as 42° N. Lat. According to the observations of Mr. Drummond, quoted by Dr. (now Sir John) Richardson, the *L. princeps* frequents heaps of loose stones, through the interstices of which it makes its way with great facility. It is often seen after sunset, mounted on a stone, and calling to its mates by a peculiar shrill whistle. On the approach of man it utters its feeble cry, like the squeak of a Rabbit when hurt, and instantly disappears, to reappear in a minute or two at the distance of twenty or thirty yards, if the object of its apprehension remains stationary. Mr. Drummond never found any burrows, and is of opinion that they do not make any,

but that they construct their nests amongst the stones. They do not make their appearance during the winter months, and hence we may infer that, like other members of the group, they lay up a store of provisions for these months; such stores, however, have not been observed.

The Rocky Mountain Lagomys is about equal in size to the *L. pusillus*, but is readily distinguished from that animal by its colouring, and the larger size of its ears: its fur is long and soft, and of a darkish grey next the skin; on the back each hair has a broad subterminal yellow-white ring, and a black point; on the sides of the body the visible portions of the hairs are of a yellow-brown hue, and on the under parts they are tipped with pale yellow: a tolerably large whitish patch is observable behind each ear: the ears are moderately well clothed on the inner side with short hairs, which are partly white, and partly black, the black prevailing near the margin, which is pure white; on the outer side the hairs covering the ears are long and fine, black on the fore part, and grey-white on the hinder part. The feet are pale, and the naked pads at the ends of the toes are distinct.

	Inches.	Lines.
Total length	7	0
Length of ear		8
Width of ditto		10
Length of fore foot and nails		8½
" of hind foot and nails	1	2½

The above description is from a specimen in the British Museum, it having been presented to the National Collection by Sir John Richardson. A second specimen, presented to the Museum by the Hudson's Bay Company, differs from the one described in having the hairs on the inner surface of the ears long, and much suffused with black.

LAGOMYS HYPERBOREUS.

The Polar Lagomys.

Lepus hyperboreus.	PALLAS, Zoographia Rosso-Asiatica, i. p. 152, published 1831.
Lagomys "	WAGNER, in SCHREB., Säugth. Suppl. vol. iv. p. 121. 1844.

Fur soft and dense, on the upper parts of the body grey-brown, on the crown of the head tinted with reddish; chest, sides of the head, neck, and body, suffused with rufous; chin and throat white; ears rounded; white at the margin; feet whitish; toes with a naked, black fleshy pad at the extremity: the fur of a lead-grey at the root.

The Polar Lagomys is described by Pallas from specimens received by him from the country of the Tschouktschis, in the north-east portion of Siberia. It is said to be about equal in size to the Norway Lemming, and hence is considerably smaller than either of the other known species. Its head is longer than in *L. alpinus*, and in form nearly resembles that of the Common Rat (*Mus decumanus*).

	Inches.	Lines.
Total length	5	3
Length of head	1	5
" of ear	0	7
" of fore foot	0	7
" of hind foot	0	10½

The subjoined dimensions are taken from the skulls of the various species of Lagomys contained in the British Museum collection.

	Lagomys alpinus.		Lagomys Ogotona.		Lagomys pusillus.		Lagomys spelæus.		Lagomys rufescens.		Lagomys nepalensis.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Total length of skull	2	1	1	10	1	7					1	$8\frac{2}{3}$
Width	1	0		$11\frac{1}{2}$		$9\frac{2}{3}$		$9\frac{2}{3}$		11		$10\frac{1}{2}$
From apex of intermaxillaries to posterior edge of glenoid cavity ...	1	$2\frac{2}{3}$	1	$2\frac{1}{2}$		$11\frac{1}{3}$		$11\frac{1}{3}$	1	$1\frac{1}{4}$	1	1
Length of nasal bones		$8\frac{1}{3}$		8		$6\frac{1}{2}$				$6\frac{2}{3}$		7
Width of ditto behind		$2\frac{1}{4}$		$2\frac{5}{8}$		$2\frac{1}{2}$		2		$1\frac{5}{8}$		$2\frac{1}{3}$
" " in front		3		$2\frac{2}{3}$		$2\frac{5}{8}$		$2\frac{1}{3}$		$2\frac{2}{3}$		$2\frac{3}{4}$
" of interorbital space		$2\frac{5}{8}$		$1\frac{1}{2}$		$2\frac{3}{8}$		2		2		$2\frac{1}{3}$
Longitudinal diameter of the joined orbital and temporal cavities		$5\frac{1}{2}$		$6\frac{1}{4}$		5		$4\frac{3}{4}$		6		$5\frac{1}{2}$
Vertical diameter of ditto		$4\frac{1}{2}$		5		4		$3\frac{3}{4}$		$4\frac{5}{8}$		$4\frac{1}{2}$
Length of palatine opening		$3\frac{2}{3}$		$4\frac{1}{3}$		$3\frac{1}{8}$		3		6		6
Width of ditto behind		$2\frac{2}{3}$		$2\frac{2}{3}$		$2\frac{3}{8}$		$2\frac{1}{8}$		$2\frac{1}{2}$		2
From back of principal upper incisor to posterior margin of palatine opening		8		$7\frac{3}{4}$		$5\frac{1}{2}$		$5\frac{1}{4}$		7		$6\frac{1}{2}$
Antero-posterior diameter of the narrow bridge of the palate		$1\frac{1}{3}$		$1\frac{1}{4}$		$0\frac{7}{8}$		$0\frac{7}{8}$				1
Width of palate, taken opposite the last molar		$4\frac{1}{4}$		4		$3\frac{1}{3}$		$3\frac{1}{8}$		$3\frac{1}{2}$		4
Length of the five upper molars taken together		$4\frac{1}{2}$		$4\frac{1}{2}$		$3\frac{5}{8}$		$3\frac{3}{4}$		4		4
" of lower jaw	1	4	1	3	1	$0\frac{1}{4}$			1	$1\frac{1}{8}$	1	$1\frac{1}{3}$
Greatest height behind		9		9		$7\frac{2}{3}$				8		$8\frac{1}{3}$
Transverse diameter of the angular portion		$3\frac{3}{4}$		$3\frac{3}{4}$		$2\frac{7}{8}$						$2\frac{3}{4}$

Fossil species of Lagomys.

Lagomys Corsicanus, Bourdet.

Founded upon a nearly entire skull discovered in the osseous breccias of Corsica, and described and figured in Cuvier's Ossemens Fossiles, 4to. ed. vol. iv. p. 199, Pl. 14, figs. 4, 5, and 6.

This skull very nearly resembles that of the *Lagomys alpinus*, having the same broad space between the orbits, but presents some slight differences in the proportions of certain parts, and is a trifle larger.

Lagomys Sardus, Wagner.

Also founded upon some remains figured and described by Cuvier (see Oss. Foss. iv. p. 203, Pl. 15, figs. 16, 17, and 18). These remains were found in the breccias of the neighbouring island—Sardinia. The principal fragment is a portion of an upper jaw containing the alveoli of the five molar teeth. According to Cuvier, the animal must have been larger than the recent species, *Lagomys Ogotona*, and smaller than the *L. alpinus*, and consequently likewise inferior in size to the fossil species of Corsica. *Lagomys* ———*?* M. Pictet refers a humerus found in the cavern at Mialet (Cévennes) to the genus Lagomys.—See his Traité Elémentaire de Paléontologie.

Lagomys Œningensis.

The examination of a crushed skeleton from the Pliocene, lacustrine formation, at Œningen, contained in the British Museum, leaves no doubt on my mind that the animal was a species of *Lagomys*. The five upper molar teeth are distinct, and the angular portion of the lower jaw preserves the characteristic form of that part in the species of Lagomys. It is very probably specifically identical with the animal whose skeleton is figured by Cuvier, and which was received from the same quarter.—See Oss. Foss., vol. v. pt. 1, Pl. 3, fig. 18, p. 62.

Lagomys spelæus, OWEN.

A British species founded by Prof. Owen upon the anterior portion of a skull preserved in the collection of the British Museum, and which is from Kent's Hole. The dimensions of this specimen are given with those of the skulls of the recent species of Lagomys, upon referring to which, it will be seen that the fossil corresponds very closely with the *Lagomys pusillus* ; there are, however, some slight differences, which, if they do not warrant us in considering the two animals as distinct, are at least sufficient to caution us against assuming their specific identity. The fossil alluded to, is figured by Prof. Owen in his History of British Fossil Mammalia, p. 213.

Genus, *Lepus*.

Lepus. LINNÆUS, Systema Naturæ (12th ed.), i. p. 77. 1766.

Leporidæ, with molars, $\frac{6-6}{5-5}$; large, and elongated ears (as long, and often longer, than the head) ; a short and very bushy tail ; the hinder legs powerful, and much longer than the fore legs.

The Common Hare and Rabbit, together with numerous other species for the most part confined to the northern hemisphere, are comprised under the generic title *Lepus*. The species being numerous, and often very difficult to distinguish, naturalists have sought for characters to subdivide the group, and more especially to distinguish the Rabbits from the Hares; but although the young of the former are blind and naked when born (at least such is the case in the Common Rabbit), and the latter are clothed with hair, and have the eyes open, and in their habits there is this difference, that the Rabbits burrow, whilst the Hares make a "form," or kind of nest on the surface nf the ground on which they squat,—no constant structural distinction has, that I am

aware, been discovered[1]. By far the greater number of the species of Lepus agree with the Hare in the habits noticed, and that animal may therefore be regarded as the type of the genus, and we shall use the term Hare in a generic sense.

Besides the difference in the number of the molar teeth, the possession of a tail, the large size of the hind legs, and the large and elongated ears, which distinguish the Hares from the species of *Lagomys* (the only other genus of Rodents in which the upper jaw is provided with more than two incisors), there are many points in the structure of the animals under consideration which require to be noticed.

Destitute of means of defence, the Hares are timid, have remarkable powers of flight, and, to warn them of danger, their senses of hearing, seeing, and smelling, are unusually developed. The eyes are very large and prominent, and,

[1] Upon comparing the bones of the feet of the Rabbit with those of the Hare, I have observed differences, some of which will probably be found to have a constant relation to the habits, but these differences would scarcely warrant a subgeneric separation of the animals which present them. The terminal phalanges of the toes in the Rabbits, for instance, differ from those in the Hare in being less deep, and less compressed, and, like the same bones in several other Mammals having burrowing habits, they are cleft—on the upper surface at least. The hind foot of the Hare possesses three bones more than is found in the Rabbit, viz. a tolerably large supernumerary bone with a convex outer surface, which is attached to the back of the os naviculare; a distinct internal cuneiform, and, attached to this, a rudimentary metatarsal of the inner toe: neither of these do I find in the Rabbit's foot. In the form of some of the bones there are marked differences. The great expanded process on the hinder, or under, part of the os naviculare, in the Rabbit's foot, is not found in that of the Hare, whilst, on the other hand, we find a large protuberance on the under surface of the external, or third cuneiform, partly taking its place. The inner metatarsal, or that which corresponds to the second in man, articulates with the second cuneiform bone by a simple and nearly flat surface in the tarsus of the Hare, whilst in that of the Rabbit the inner metatarsal sends up a process on the inner side, which, enclosing the second cuneiform, runs up to articulate with the naviculare; this process, indeed, occupies the place of the first cuneiform. In the form of the proximal extremity of the outer metatarsal, the two animals, moreover, differ considerably.

being placed laterally, enable the animal to see in all directions, or nearly so, at the same time; the nasal portion of the skull[1] is very large in proportion to the part devoted to the protection of the brain. The upper surface of the skull is strongly arched in the longitudinal direction, its highest point being rather behind the centre of the orbit; from this point it descends rather suddenly to the occiput, but forms nearly a straight line in front; the cranial portion is also convex in the transverse direction, but the upper surface of the facial part is flattened. The broad nasal bones send down from the inner surface some thin bony laminæ, of which the principal one is longitudinal, and are somewhat loosely attached to the skull. The frontal bones are remarkable for the large supra-orbital processes which are thrown out from them, a character which is almost peculiar to the Hares; the supra-orbital processes, after leaving the frontal bone, are greatly produced, both in the anterior and posterior directions, the extremities being free, and they form the whole upper boundary of the orbits. A slight depression in the comparatively small temporal bone marks the boundaries of the diminutive temporal muscle. The nasal process of the superior maxillary bone is remarkable for being pierced by numerous perforations; the lachrymal bone is situated almost entirely within the orbital cavity, but throws out a small process which projects beyond the boundary of the orbit: the infra-orbital opening is small, and serves for the transmission of the nerve only; the zygomatic arches are compressed, moderately deep, straight, and parallel to each other, or very nearly so; no suture marks the anterior boundary of the malar bone, which, as in the species of *Lagomys*, projects in the form of a pointed process beyond the hinder boundary of the glenoid cavity, but is less prolonged than in those animals. The

[1] Plate 2, fig. 2.

occipital surface of the skull is small, and slopes inwards from the upper edge, which thus overhangs the lower part; the supra-occipital bone presents a singular conformation, the upper surface being divided into three nearly equal parts—a square raised platform in the middle, and a wing-like process on either side; and there are numerous minute perforations in these parts. The auditory bullæ are of moderate size, and the petro-tympanic bone is but loosely attached to the cranium, but is held in its place by a little bony band thrown out from the temporal bone. The opening for the spinal chord is very large. Viewing the under surface of the cranium[1], the most striking point is the very imperfect condition of the palate; the large incisive openings, and the deep posterior emargination, contract the palate, so that it forms only a narrow bridge, crossing opposite the anterior molars. Owing to the contracted form of the palate, the sphenoid bones are exposed; the bodies of these bones are perforated and hollow within[2]. The lower jaw (Plate 2, fig. 2 *b*.) is remarkable for its flatness, and the great height and width of the ascending ramus: the coronoid process is represented by a thin plate, of but little width, which runs along the anterior edge of the ascending ramus: a perforation passes through this ascending branch immediately behind the last molar. The angular portion of the jaw is on the same plane with the horizontal and ascending rami, is very large, and approaches to a semi-circular form, but presents two obtuse angles, as will be seen in the figure.

The upper and lower incisors are about equal in width, and

[1] Plate 2, fig. 2 *a*.

[2] Not only are the bodies of two of the cranial vertebræ perforated, but the corresponding parts in nearly the whole of the vertebræ in the Hares are perforated; usually the openings, two in number, are confined to the inner surface of the body, but many of the lumbar vertebræ likewise present two perforations on the under surface.

their diameter is less in the antero-posterior, than in the transverse direction ; those of the lower jaw have the anterior surface smooth and flat, and those of the upper jaw have a strong groove in front, which is placed rather nearer to the inner than to the outer side of the tooth : the extra pair of incisors are small, and placed behind the principal pair[1]. The molar teeth are small in proportion to the skull ; those of the upper jaw, with the exception of the first and last, have a vertical groove, both on the outer and inner surface ; and the foremost broader tooth has three grooves ; the crowns of these teeth are broader than long, and present three transverse ridges ; the foremost is somewhat smaller than either of the four following teeth (which are of equal size), wants the mesial ridge, and has a small fold of enamel indenting its anterior surface ; the hindermost molar is very small, and in the form of a compressed cylinder. The crowns of the molars of the lower jaw have their longitudinal and transverse diameters nearly equal ; like those of the upper jaw, they present three transverse ridges of enamel, and the shaft of each tooth is grooved on the outer and inner side, but the grooves are much stronger, and so indent the tooth that its crown presents two salient angles on each side : the hindermost molar is considerably smaller than the rest. The motion of the jaws must be chiefly lateral in the Hares, for the crowns of their molar teeth are never worn flat, as in other Rodents which have rootless molars.

With regard to the vertebræ of the trunk, the points most worthy of notice are, that the foremost, or atlas vertebra, has but one perforation on either side, besides the usual one in the transverse process, and this passes from the outer to the inner surface, and has its outlet immediately in front of the

[1] See Plate 2, fig. 2 *a*, and 2 *c* ; the latter figure represents the upper incisors viewed from the side.

transverse process. The posterior dorsal and the lumbar vertebræ have the anterior articular processes much produced in the vertical direction, in some of these vertebræ rising as high as the spinous process; the three lumbar vertebræ are remarkable for having a spine on the under surface of the body. The scapular bone is much elongated; the humerus is perforated immediately above the lower articular surface, which presents two strongly-raised and acute ridges, and in this respect the humerus of the Hare differs from that of most other Rodents. The femur, which is long and slender, has a third trochanter in the form of a ridge, which is produced in the middle into an obtuse angle; it is situated unusually near the upper extremity of the femur. The fibula joins the tibia rather above the middle of that bone.

LEPUS TIMIDUS.

The Common Hare.

Lepus timidus.	LINN., Syst. i. p. 77.
" "	SCHREB., Säugth. iv. p. 860. Pl. 233 A.
" "	PALLAS, Zoographia Rosso-Asiatica, i. p. 148.
" "	DESM., Mammalogie, Part 2. p. 347.
" "	WAGNER, SCHREB., Säugth. Suppl. iv. p. 75.
" "	BELL, British Quadrupeds, p. 333.
" *Europæus.*	PALLAS, Glires, p. 30.
Lièvre.	BUFFON, Hist. Nat. vi. p. 247, Pl. 38: DAUBENT. p. 264, Pl. 39—49—Anatomy.
Hase, of the Germans.	

Ears longer than the head; fur mottled with black and brownish ochre; back of the neck and the limbs externally suffused with rufous; abdomen, inner side of limbs, and tail, white; the upper surface of the latter black; ears black at the point.

Excepting in the more northern parts, the Hare is found throughout Europe, extending southward to the Mediterranean, being found in Italy and Greece. According to Pallas, it occurs in Russia below the 55th parallel of latitude, and there, is the only species found. It is a native of Poland, Lithuania, and the Crimea; is found about the Caucasus, the lower part of the Volga, and the southern extremity of the Ural chain of Mountains, and extends into Persia. In Norway and Sweden, as well as in Siberia, it is wanting.

The Hare feeds by night, and during the day lies in its seat, or form; a mere depression in the ground made by the animal, usually near some bush. When crouched on its seat it is with difficulty distinguished, and it will often allow a person to approach without quitting its position. Timid, and swift, the Hare has been an object of the chace from the time of the Romans. It swims well, and readily takes to the water, when, by crossing a stream, or even a river, a more plentiful supply of food can be obtained.

The female Hare has ten mammæ, and brings forth from two to five young at a birth.

A full-grown Hare weighs eight or nine pounds, but notices of Hares of twelve pounds in weight are on record, and in the Magazine of Natural History mention is made of a Hare attaining even thirteen pounds in weight.

Black or white varieties occasionally occur, but the Common Hare does not change its colour in the winter months, as is the case with many of the species inhabiting the more northern latitudes. Its fur, on the back, is white at the root, and each hair has a broad black space in the middle, which is followed by an equally broad ring of a rufous yellow hue, the extreme points being black; the yellow ends of the hairs lap over the lower black parts, but do not entirely hide them, and hence the mottled black and yellowish appearance of the

upper parts of the body. On the sides of the body the fur is of a pale grey next the skin, and chiefly rufous yellow externally, and on the under parts they are white, slightly tinted with reddish, and at the root they are grey-white; the limbs are whitish internally, but on the outer surface they are rufous, or of a yellowish rust colour, as are also the chest and back of the neck, but the latter part is of a less bright hue than the limbs, and is whitish near the roots of the ears. The ears are white externally, excepting on the fore part, where they are grizzled with black and yellow, and at the tip, which is black; the inner surface of the ear is for the most part clothed with yellow hairs; hairs of this colour form a conspicuous ridge on the anterior margin; the hinder margin is fringed with whitish hairs, and within the latter margin, but near to it, is a long and broad mark formed of hairs, which are partly black and partly yellow; the black prevails near the margin: the black at the tip of the ear extends downwards about half an inch, but on the posterior margin it runs down about one-third of the entire length of the organ. The chin, throat, and orbit of the eye, are white, and a broad whitish mark runs along the side of the face from the muzzle to the ear. The outer surface of the thigh is always greyish: the tail is white below, and at the point, and black above; the dense fur on the under surface of the feet is of a dirty brownish colour, but it is very pale on the hinder half of the tarsus.

The collection of the British Museum contains an English specimen of the Common Hare which is worthy of notice, its prevailing hue being sooty brown.

The subjoined admeasurements are taken from a tolerably fine male Hare:—

	Inches.	Lines.
Length from tip of nose to root of tail (measuring along the curve of the back) ...	23	0
" of ear	4	10

	Inches.	Lines.
Length of tarsus to the end of the nails ...	5	8
" of tail, including the hair, about ...	4	0
" of skull[1]	3	10½
Width of ditto	1	9½
" between the orbits	1	2
Length of nasal bones	1	8
Width of ditto behind		10½
" " in front		8
Length of incisive opening	1	0
" of palate		3¾
Width of upper incisors		3
From back part of principal incisors to molars	1	2
Length of the six upper molar teeth, taken together		7¾
" of lower jaw	2	9
Height of ditto	1	8
Transverse diameter of the angular portion ...	1	0½

The scapula measures 3″ 5½‴ in length, and 1″ 9‴ in width behind; humerus, 4″ 0″; ulna, 5″ 2‴; femur, 5 2½; tibia, 5 11½.

As many of the species of Hares approach, in their general appearance, very nearly to the Common Hare, we shall use that animal as an object of comparison, and hence it has been described more in detail than otherwise would have been necessary. All the Hares have a fringe of long hairs on the anterior margin of the ears, and this, for brevity sake, we shall call *the fringe;* the outer surface has the anterior portion densely clothed with short, adpressed hairs, and these being of a darker colour than elsewhere, form a dark band on that part—this will be called the *external band;* and, for a similarly clothed part on the inner surface of the ear, which runs along the hinder margin, the terms *internal band* will be used. The remaining inner portions of the ear are naked, or very nearly so, and need not be noticed. The bands of dark coloured hairs are very conspicuous in the variable Hare, when in its winter dress, for they keep their dark hue when almost every other part is white.

[1] This skull is represented on Plate 2, fig. 2; the nasal bones are here foreshortened.

LEPUS MEDITERRANEUS.

The Sardinian Hare

Lepus Mediterraneus. WAGNER, in Wiegmann's Archiv für Naturgeschichte, 7th year, Pt. 1, 1841, p. 136; SCHREB. Säugth. Suppl. vol. iv. p. 77, Tab. 233 c. 1844.

Much smaller than the *L. Timidus;* ears longer than the head, nearly naked in the middle, and black at the apex; the back of the neck and limbs of a reddish ochre colour; tail black above, white beneath; a white mark behind the eyes.

Dr. Wagner regards as distinct from the common species, the Hare which inhabits Sardinia, and which there is some reason to believe occurs likewise in Gibraltar. It approaches the *L. timidus* in many respects, but is fully one-third smaller; its ears are proportionably rather longer, and they are more sparingly clothed with hairs; the hinder part of the outer surface of the ear is of a less pure white; the occiput is of a more uniform rusty red hue, and there is a greater admixture of black in the colouring of the upper parts of the body. The under parts of the body are white, but tinted with yellow.

	Inches.	Lines.
Length	15	5
Head	3	0
Ear	4	3

In the British Museum are specimens of a small Hare, brought from Tunis, and from Kirkany, a small island situated very near the coast, by Mr. Fraser, which agree so closely with Dr. Wagner's description, as to leave little doubt of their specific identity with the Sardinian species. Its skull is not longer than that of the Common Rabbit, and beyond the difference of size, offers many points of distinction when compared with that of the Common Hare; the most striking

are, the contracted form of the nasal bones in front, their being truncated at a right angle behind, where, however, they are separated in the mesial line by a small and nearly semi-oval projection of the frontals, the small size of the supra-orbital processes, and the small depth of the zygomatic arch. The nasal bones are shorter than those of the Rabbit's skull (which the Tunis Hare much more nearly resembles), and, mereover, differ in being truncated behind ; the cerebral portion of the skull is longer ; the supra-orbital process shorter, the zygomatic arch less deep ; the incisive opening, although of the same length, is much broader behind ; the palate shorter, and the incisor teeth are rather narrower. The most strking difference, however, and one in which the present species differs from all others of the genus hitherto examined, consists in there being but five molar teeth on either side of the upper jaw ; the small sixth molar being absent ; in this respect the Tunis Hare resembles the species of *Lagomys*, but in no other character that I can perceive[1]. Its dimensions are—

	Inches.	Lines.
Length	3	0½
Width	1	4¾
Length of nasal bones	1	1¾
Width behind		7⅔
" in front		4¼
" between orbits		10¼
Depth of zygomatic arch		2⅓
Length of incisive opening		9½
Width of ditto behind		4⅓
Antero-posterior diameter of palate		2⅔
Width of upper incisors		2
Length of the five upper molars, taken together		5¾

[1] With such a singular exception, one is anxious to examine other specimens of this species of Hare, to ascertain whether the difference in the number of molar teeth is not peculiar to the individual, for I have seen but one skull. It presents another peculiarity, and that is in having two small oblong openings in the frontal bones, placed near the mesial line, and close to the parietal suture.

The animal differs from the Common Hare in its general colouring, being much paler: the limbs and back of the neck are of a delicate yellowish rufous, and the sub-terminal rings on the hairs of the back are almost cream colour, whilst these hairs are very distinctly terminated with black; the feet are mottled with whitish, and the rufous colour on the tibia is confined to the hinder part, the fore part being pure white; a large rufous patch is observable immediately in front of the thigh: the ears are margined with brown at the extremity internally, and with brown black externally; the dark colour not extending downwards on the middle part of the ear, as in the Common Hare, where it forms a large patch of three-quarters of an inch in depth. The tail is sooty black along the mesial part of the upper surface.

The pale hue of this species approximates it to the *Lepus Ægyptius*, but in that animal the ears are much longer[1].

	Inches.	Lines.
Length, about	16	0
" of ear	4	3
" of tarsus	4	1

LEPUS HYBRIDUS.

The Russak Hare.

Lepus hybridus.	(Pallas) Desmarest, Mammalogie, Pt. 2, p. 349. 1822.
" *medius.*	Nilsson, Skandin. Faun. i. p. 224.
" *aquilonius.*	Blasius, in den Verh. der Vers. d. Naturf. z. Braunschw., 1842, p. 88.
" "	Wagner, Schreb., Säugth. Suppl., iv. p. 78. 1844.
" *altaicus.*	(Eversm.) Gray, in List of the Mammalia in the British Museum, p. 126. 1843.

[1] The skull has not been removed from the specimen from which this description is taken, and I find the incisor teeth rather broader than in the skull described.

Lepus variabilis, hybridus.	(PALLAS) SCHREB., Säugth., iv. Pl. 235 c. 1792.
Russak.	PALLAS, Nov. Spec. Quad. e Glirium Ordine, p. 5, 1778; Zoographia Rosso-Asiatica, i. p. 147. Edit. 1831.

Ears rather exceeding the head in length, with a black patch at the apex, which is much extended on the outer surface of the ear: fur long and silky; on the back mottled with black and pale yellow; on the sides of the body and the haunches nearly white; on the under parts, and inner side of the limbs, pure white: the fore legs in front, and the tarsi, suffused with very pale rusty yellow: tail black above, white below.

This animal is found in Russia, generally, according to Blasius, between the 55th and 63d parallels of latitude; a specimen sent to the British Museum as the *Lepus Altaicus* of Eversman, being from the Altai Mountains, shows that it ranges a little further south, and, if I am right in identifying this animal with the *L. medius* of Nilsson, it occurs likewise in Zealand.

From *L. variabilis* and *L. Tolai* the present species is readily distinguished by its superior bulk, and the comparatively great extent of the black on the outer surface of the ears; from *L. variabilis* it differs, moreover, in having longer ears, and the upper surface of the tail black.

As there appears to be considerable difficulty in determining the European species of Hares, I shall proceed to point out the characters of the animal under consideration more in detail; first observing, that the specimen upon which my notes were made, is in the Museum at Leyden[1].

As regards the colouring, I have to observe, in addition to the points already noticed, that the fur on the upper parts of

[1] It is labelled, "*Lepus russatus*, F. Cuvier; Russac en Russie, mentionné par Pallas, donné par H. F. Boie, tué le 3 Mars, 1824, environs de Petersbourg."

the body has a very mottled appearance, perhaps owing to its undergoing a slight change in the winter and summer months: the hairs are pure white at the root, have a sooty black ring about the middle, a broader, delicate yellow ring beyond, and the extreme point black. On the sides of the body, which are almost white, there is a faint tinge of yellow, and the hairs on this part are brown in the middle: the cheeks are white, and there is a yellowish patch on the sides of the muzzle. The ears have the external and internal bands composed of party-coloured, black and yellow hairs; the black patch at the tip, externally, is extended in the vertical direction for about one inch, or one-fifth of the entire length of the organ; but on the inner side the black runs downwards from the point scarcely a quarter of an inch. The throat is white, and the chest is nearly white, but here the hairs are of a dirty rust-colour in the middle.

	Leyden Museum. Inches.	Lines.	British Museum. Inches.	Lines.
Length from tip of nose to root of tail	26	0	26	0
From tip of nose to ear, about ...	4	4	4	10
Length of tail, including the hair, about	6	0	5	9
" of ear	5	0	4	8
Width of ditto	2	6	2	8
Length of tarsus	6	8	6	6

A skull, also in the Leyden Museum, labelled as that of the Russak, agrees more nearly with the skull of *L. timidus* than with that of *L. variabilis:* although considerably larger than the skull of *L. timidus*, the teeth are very nearly of the same size; the incisive openings are relatively larger, and the palate has a smaller antero-posterior diameter. Its dimensions are as follows:—

	Inches.	Lines.
Total length of skull	4	1[1]
Width	2	0

[1] Perhaps a trifle more; the hinder part of the skull is mutilated.

	Inches.	Lines.
Width between the orbits	1	2⅔
Length of nasal bones	1	11
Width of ditto behind		11½
" " in front		9⅓
Antero-posterior diameter of palate		3
Width of upper incisors		3⅓
From principal upper incisors to molar teeth ...	1	4½
Length of six upper molars taken together ...		7⅓

The specimen already alluded to as being in the British Museum collection, does not differ in its colouring from the one described: its dimensions are given in the second column.

LEPUS TOLAI.

The Baikal Hare.

Lepus Tolai. PALLAS, Nov. Spe. Glir., p. 20; Zoographia Rosso-Asiatica, i. p. 149.
" " SCHREB. Säugth. iv. p. 878, Pl. 234.
" " LICHT. in Eversm. Reise, p. 118.
" " DESM., Mamm., p. 349.
" " WAGNER, Schreb. Säug. Suppl., iv. p. 84.
The Baikal Hare. PENNANT, Synopsis of Quadrupeds, p. 253. 1771.

Fur long, dense, and soft; upper parts of the body mottled with a delicate yellow (almost cream-colour), and dusky, or brownish black; sides of the body grey-white; ears about equal to the head in length, margined with black at the apex; back of the neck of a very pale and delicate rufous tint.

Inhabits the regions beyond Lake Baikal, and is found throughout the Mongolian Desert, where likewise *Lepus variabilis* occurs.

Unlike the *L. variabilis*, this species does not become white in the winter months: the general colouring of its fur is very nearly the same as in *L. hybridus*, but from that species, as well as from the Varying Hare, it is at once distinguished by the black on the ears being confined to the margin; the delicate rufous tint of the occiput and back of

the neck offers another point of distinction. Its size is about equal to that of the *L. variabilis*, and consequently inferior to the Russak Hare, with which, in some other respects, it is more likely to be confounded.

The following description is drawn up from a specimen in the British Museum, which agrees so closely with the accounts of the *L. Tolai* given by Pallas and Lichtenstein, as to leave no doubt that it is correctly named in our collection.

The fur on the back is of a very delicate grey, or grey-white, next the skin, and each hair is of an equally delicate rufous tint in the middle, has a black ring beyond the middle, is then of a very pale rufous yellow (nearly cream-colour), and terminated with dusky black. The chest and sides of the body are of a pale ashy grey; the hairs on these parts are dirty white at the point, of a pale rufous brown in the middle, and of a more distinct grey hue next the skin than are those of the back. On the under parts of the body the hairs are uniformly white. The legs are slightly tinted with yellowish externally, and the feet are white, or very nearly so, but slightly mottled with pale rufous. An indistinct whitish mark is observable on the sides of the head. The ears are well clothed, and the external and internal coloured bands consist of hairs which are freckled with cream-colour and black; on the inner surface of the ear the black and cream-colour are about equal in proportion, whilst the cream-colour prevails on the outer surface. The apical portion of the ear is fringed with black; and on the outer surface a dusky hue is observable on the parts immediately adjoining the margin; there is, however, no distinct black patch such as is observed in the *Lepus variabilis* and other nearly allied species. A narrowish yellow band follows the course of the apical black fringe on the inner surface of the ear. The

upper surface of the nose is of a delicate yellow tint. The general hue of the animal is very pale.

	Brit. Mus.		From Pallas. Male.		From Pallas. Female.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length from tip of nose to root of tail ...	22	0	21	5	28	4
" of tail, with the hair, about ...	4	0	4	1	3	6
" from nose to ear, about	4	0				
" of ear	4	0	4	10	4	8
Width of ditto	2	5	2	6	2	5
Length of tarsus	5	6	5	3	5	0

The skull of *Lepus Tolai* is much smaller than that of the Common Hare; has the nasal bones relatively smaller, more contracted in front, and depressed behind; the supraorbital processes are also relatively smaller, the zygomatic arch less deep, and the incisive opening narrower. Upon comparing it with the cranium of *Lepus variabilis*, it presents many points of distinction, the most striking of which are the smaller size of the supraorbital processes, and the comparatively small depth of the zygomatic arch; the incisive opening is less dilated in the middle. The skull, moreover, is more depressed, and consequently less strongly arched above than that of *L. variabilis*[1]; the upper incisor teeth are less deeply grooved, and the molars are smaller.

	Inches.	Lines.
Total length of skull[2]	3	6
Width	1	8½

[1] The height of the skull in a vertical line above the third molar tooth, is 1 inch in *L. Tolai*; and, in a skull of *L. variabilis*, the length of which does not surpass that of the *L. Tolai*, the height in the same part is 1 inch 1½ lines; the zygomatic arch in the same skull is 4¼ lines in depth, whilst in *L. Tolai* it is only 3 lines.

[2] A *very* small portion of the hinder part of the skull is wanting, and has been allowed for in the above dimensions.

	Inches.	Lines.
Width between orbits		$11\frac{1}{2}$
Length of nasal bones	1	$4\frac{1}{4}$
Width of ditto behind		$8\frac{1}{4}$
" " in front		$5\frac{1}{4}$
Length of incisive opening		$10\frac{1}{3}$
Width of ditto behind		$4\frac{2}{3}$
Length of six upper molar teeth, taken together		$7\frac{1}{4}$

This skull is in the collection of the British Museum.

LEPUS VARIABILIS.

Varying Hare.

Lepus variabilis. PALLAS, Glires, pp. 1 and 30.
" " SCHREB., Säugth. iv. p. 885, Pl. 235 A, B.
" " DESM., Mammalogie, p. 349.
" " FLEMMING, British Animals, &c. p. 22. 8vo. Edinburgh, 1828.
" " (Varying Hare). BELL, British Quadrupeds, p. 343. 1837.
" " and *borealis*. NILSSON, Skandin. Fauna, Plates 16 and 19, Pt. 6, p. 1, and Pt. 7, p. 2. 1832.
" *albus*. (BRISSON) JENYNS, British Vertebrate Animals, p. 35. 1835.
Alpine Hare. PENNANT, British Zool. (4th edit.), i. p. 102, Pl. 10, No. 21, 8vo. 1776-7.
Varying Hare. SHAW, General Zoology, ii. p. 201. 1802.
Lepus Hibernicus. BELL, Brit. Quad. p. 341.
" *timidus*, var. β. JENYNS, Brit. Vert. An. p. 35.
Irish Hare. YARRELL, Proceedings of the Zoological Society for July, 1833, p. 88.

Ears about equal to the head in length, with a smallish, but distinct black patch at the tip. *Summer fur*—general hue rusty brown, being finely pencilled with black and rufous yellow; under parts impure white: tail white; greyish above. *Winter fur*—white; ears with a black tip, and the external and internal bands freckled with black and yellow; upper surface of the nose generally yellow.

Inhabits Ireland and Scotland, and occasionally extends into Cumberland: on the continent, it is found throughout Scan-

dinavia, extending northwards to the Arctic Ocean: thence it is traced through Siberia, north of the 55th parallel of latitude, into Kamtschatka. It appears to be for the most part wanting in the central portions of Europe, but reappears again on the Alps of Switzerland, and extends eastwards as far as Salzburg. It is said, moreover, to occur in Bavaria.

The Varying Hare differs from the Common Hare in being rather smaller, in having the ears proportionately smaller, and with the black less extended at the point, especially on the outer surface: the tail, moreover, is shorter, and wants the black on the upper surface; the pale and dark annulations of the hairs of the fur are narrow, and the animal does not present that mottled appearance which is observed in the colouring of the Common Hare; the white cheek mark is likewise wanting. In the winter months the two animals are easily distinguished, since the present species becomes white, whilst the *Lepus timidus* undergoes no perceptible change. The change to white colour in the Varying Hare is distinctly traced to the effects of the low temperature to which that animal is subjected during the winter months, in the northern regions which it inhabits, and on the elevated parts of the mountains to which it appears to confine itself when found in more temperate parts of Europe or Asia. The colouring matter leaves the hairs when thus subjected to the effects of cold, for the summer fur is not cast off, and replaced by new white hairs[1].

In Scotland the Varying Hare begins to change its colouring towards the end of autumn, and by the middle of November it has usually become wholly white, with the exception of the upper surface of the nose, the tips of the

[1] I am strongly inclined to believe that the extreme cold, in such cases as the present, by checking the plasmatic circulation, not only bleaches, but ultimately destroys the vitality of the hairs, and that this is the reason why they are after a time cast off, to be replaced by new and coloured hairs.

ears, and the bands of the ears. These parts I have generally found, in Scotch specimens, retain the summer hue more or less perfectly, but in Swedish specimens, every part becomes white, with the exception of the point of the ears, which invariably retains the black hue.

A specimen now before me, which was purchased in the London market in the month of December, and no doubt is from Scotland, is perfectly white, with these exceptions—that there are a few scattered black hairs on the back, and similar black hairs on the chest, which being here tolerably numerous, give to the part a greyish tint. The tip of the ears is black, and the external and internal bands are composed of hairs which are partly black and partly yellow; the upper surface of the muzzle is yellow, and the crown of the head has very many party-coloured black and yellow hairs. I have seen many specimens like this, from Scotland: its dimensions are given in the first column, and those of its skull and some other parts of the skeleton, are likewise appended to this account.

A specimen of the Varying Hare, in its summer fur, which I observed in the Leyden Museum, had the general hue of the fur brown, obscurely tinted with rufous; the outer surface of the legs was nearly of the same tint as the body; the tibia, however, was somewhat tinted with soot colour, and the tarsi were whitish; the cheeks rufous yellow; the chest of the same colour as the sides of the body, but a trifle paler; the bands of the ears dark, being pencilled with black and yellow; the margin white, excepting at the point, where there was a conspicuous black patch, having a diameter of about half an inch in the vertical direction, on the outer surface of the organ, and a trifle less extended on the inner surface. The throat and under parts of the body white; the tail also white, but somewhat suffused with soot colour on the upper surface.

A specimen in the British Museum, sent by M. Sundevall, and which it appears to me is not quite in its summer fur, differs from the above in being of a somewhat less rich hue; and the tail is merely greyish above. The tips of the ears have a similar black patch, which is neither more nor less extended; indeed, a similar patch I have invariably found on the ears of all specimens which have come under my notice.

The Irish Hare agrees in all essential particulars with the above specimens, but is of a richer colour: its fur is shorter than that of the Common Hare, and, as it will not felt, like the hare of that animal, it is valueless. The general tint of the fur is rufous brown, a tint produced by the admixture of black and reddish yellow, the exposed ends of the hairs being of these colours. The hairs on the back are of a very pale grey colour at the root, rather narrowly annulated with rufous-yellow towards the point, and black at the point. The head is of a brighter colour than other parts, and the sides of the body are less distinctly pencilled with black than the back; the hind feet are somewhat mottled with white; the haunches greyish; the chin, throat, and abdomen, are white, but not very pure; the tail is also white, excepting on the upper surface, which is greyish. The ears have a black patch at the tip, which is rather more extended on the outer surface than on the inner, having a vertical diameter of about half an inch on the former.

Mr. Thompson, of Belfast, who has carefully compared the Irish Hare with specimens of the *Lepus variabilis* from the continent, is of opinion that these animals are specifically identical[1]—an opinion in which I agree.

The Irish Hare only occasionally becomes white in the winter.

[1] Prof. Blasius, who has likewise compared these animals, has arrived at the same conclusion.

	From Scotland[1].		From Scotland.		From Scotland.		From Lapland.		From Sweden.		Irish Hare.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length from tip of nose to root of tail ...	20	0	22	6	21	9	25	6	21	0	23	0
" from tip of nose to ear	3	9					4	3	4	2	3	11
" of ditto to eye	2	1										
" of ear	3	8	3	6	3	6	3	5	4	3	3	6
Width of ditto	1	11							2	2	2	0
Length of fore leg and foot, from the elbow joint	7	0										
" of the fore foot and nails	3	0										
" of hind leg and foot, from the knee joint	10	6										
" of hind foot and nails	6	0	6	4	6	3	6	6	6	6	6	0
" of tail, including the fur, about ...	4	3					4	3	4	6	4	0
" of ditto without the skin	3	0										

Two skulls, from specimens of the *Lepus variabilis* bought in the London market, agree very closely with each other, and differ from a skull of the Common Hare, in being smaller and proportionately rather broader; in having the nasal bones

[1] These dimensions are taken from a fresh specimen, the weight of which was 5½ lbs. The admeasurements in the other columns are from stuffed specimens.

smaller and more contracted in front, the incisive opening also more contracted in front, and the palate shorter, owing to the antero-posterior diameter of the palatine portion of the palatine bone being considerably less. The incisor teeth, moreover, are distinctly narrower.

	Inches.	Lines.	Inches.	Lines.
Total length of skull	3	5½	3	7
Width	1	9½	1	9½
" between orbits	1	1	1	2⅓
Length of nasal bones	1	3¾	1	4½
Width of ditto behind		8¾		8¾
" " in front		6⅓		6½
Distance between upper incisor teeth and the molars	1	0¾	1	1½
Antero-posterior diameter of the palate		3		2¾
Length of the six upper molar teeth, taken together		7½		7½
Width of the incisors		2½		2½
Length of scapula	2	11		
Greatest width of ditto	1	5½		
Length of humerus...	3	11		
" of ulna	4	7½		
" of radius	4	0		
" of bones of fore foot taken together	2	9		
" of femur	4	8		
" of tibia	5	6		
" of bones of hind foot, taken together	5	6		

[1] The dimensions in this column are from the skull and other parts of the skeleton of the animal, the admeasurements of which are given in the first column in the preceding series of dimensions. Upon preparing this skeleton I was surprised to find that the structure of the tarsus did not agree with my description of that of the Common Hare at p. 34 of the preceding part of this work, and was hence led to re-examine the specimens from which my description was taken, and ultimately to discover that the foot alluded to, and supposed to be that of the Hare, is, in fact, the foot of an *Agouti*. The note at the bottom of p. 34 should be either expunged, or altered.

LEPUS CANESCENS.

The Ashy-grey Hare.

Lepus canescens. NILSSON, ARCH. Skand. Beitr. i. p. 172.
" *borealis.* var. NILSSON, Illuminerade Figurer till Skandinaviens Fauna, 6th Part, p. 1, Pl. 22. 1838.

Fur long and soft, ashy-grey on the upper parts of the body, white on the under parts; ears about equal to the head in length, with the apex black, and a black fringe extending about half way along the hinder margin; tail white, slightly tinted with grey on the upper surface.

Inhabits Scandinavia.

This animal was formerly regarded by Nilsson as a variety of the *L. variabilis*, but is now recognized by that naturalist, as well as by Sundevall, as a distinct species. It appears to be chiefly confined to the southern parts of Scandinavia, is found throughout Gothland, and extends northwards to Jaemtland.

From the examination of a specimen sent by Sundevall to the British Museum, I am induced to agree with the two naturalists above mentioned, with regard to the distinctness of this species. This specimen is in its winter fur, which, unlike that of the *Lepus variabilis*, is of a pale ashy-grey hue. The fur on the back is composed of hairs which are of an ashy white colour at the root, very pale rufous brown beyond, followed by a broad grey-white ring, and a dusky point: the longest hairs are for the most part dusky. The sides of the body, and the limbs, are chiefly of an ashy white tint; the feet are white, but in parts suffused with rufous; the fore feet most distinctly so. The whole of the under parts, including the chest (an uncommon circumstance), are white, and so is the tail, but this latter is slightly tinted with

grey on the upper surface. The crown of the head is faintly suffused with rufous, and the nose is rufous-yellow above. The ears are well clothed; the external band is formed of party-coloured, pale rufous, and black hairs, and so is the internal band, but here the black is more conspicuous: the black at the point of the ear extends down about half an inch on the inner side, and about three quarters of an inch on the outer; and, on the margin of the ear, is a fringe of black hairs, which, on the fore part of the ear, extends about an inch from the point, whilst on the hinder margin the black is continued to below the middle of the ear.

	Inches.	Lines.
Length from tip of nose to root of tail ...	21	0
" from nose to ear	4	3
" of ear	4	0
Width of ditto	2	1
Length of hind foot and nails	6	0
" of tail, including the fur	5	0

LEPUS TIBETANUS.

Tibet Hare.

Lepus Tibetanus. WATERHOUSE, Proceedings of the Zoological Society for January, 1841, p. 7.

? " *Oiostolus.* HODGSON, Journ. of the Asiatic Soc. of Bengal, vol. ix. p. 1186, Feb. 1841.

Ears longer than the head, margined with yellow-white internally; externally with the apex edged with black, and with a narrow edging of black, extending about half way down the hinder margin: general hue palish ashy grey; the back mottled with dusky and yellowish white; back of neck pale rufous brown; legs rather long, and chiefly white; tail white, with the upper surface grey-black.

Inhabits Little Tibet.

The above description is taken from a species of Hare

presented to the Zoological Society by Mr. Vigne, relating to which that gentleman furnishes us with the following particulars[1]:—

"The Hares of Little Tibet, which is a barren country, are found almost exclusively within, or within reach of, sandy valleys, through which a stream flows, creating on its flat banks just verdure enough for them to feed upon. They lie in 'forms' under rocks and stones; sometimes, when pursued, they will take to any natural hollows beneath them, and are occasionally, and, in fact, frequently, sheltered by the thick bushes of Tartarian furze, with which the valleys of Little Tibet abound, more or less. They do not burrow, but scratch away a deep 'form' under a stone or rock."

In its pale grey hue, having a slight yellow tint only on the back, this species agrees most nearly with the *L. Tolai* and the *L. hybridus*; it is, however, a much smaller animal than the last mentioned species, and differs from both in having proportionately larger ears, and in wanting the black patch on the inner surface of the apical portion of those organs. The same characters distinguish the Tibet Hare from the *L. canescens* (also a pale grey species), and *L. variabilis*. Other differences present themselves when the skull of the present species is compared with that of either of the animals just mentioned. In the ears being pale at the apical margin internally, the Tibet Hare agrees with the *L. ruficaudatus* of India, but besides the differences in the colouring of these two species, the Tibet animal is readily distinguished from the Indian, by its longer legs and tarsi.

The fur is moderate as to length and texture, of a very pale grey next the skin, on the upper parts and sides of the body, and pale brownish ash colour externally on the latter parts; on the back, each hair of the ordinary fur is dusky

[1] See the Zoological Society's Proceedings as above quoted.

beyond the middle, has a cream-coloured subterminal ring, and a black point: the hidden parts of the longer hairs are almost entirely white. The back of the neck is of a very pale rufous brown, inclining to white immediately below the ears, and the chest is very nearly of the same tint. The fur on the under parts of the body is white, obscurely suffused with cream-yellow; the orbit of the eye is white, and the legs and feet are very nearly white; a pale ashy grey tint is observable on the outer surface of the hind legs, as well as on the fore part of the anterior pair, and the fore foot is somewhat suffused with yellow; the dense fur on the under surface of the feet is of a dirty brown colour. The ears, which are considerably longer than the head, are for the most part clothed with white hairs internally; the band on the hinder part is of an ashy grey colour, and somewhat indistinct; at the apical margin the hairs are yellow-white, but the black fringe of the outer surface projects slightly beyond the pale fringe of the inner one; the ear, externally, is dusky immediately below the black edging at the tip, and on the fore margin a narrow black line is seen to descend about an inch from the point, whilst on the hinder margin (as in *L. canescens*) a similar black line runs full half way down the ear. The tail is of moderate length; white, excepting on the upper surface, which is greyish black. The groove in the upper incisor very nearly divides the tooth into two equal parts, and is very deep.

	Inches.	Lines.
Length from tip of nose to root of tail ...	18	0
" from nose to ear	3	8
" of ear	4	7
Width of ditto	2	4½
Length of tarsus, including the nails ...	5	0
" of tail, including the fur	4	6

A skull of a Tibet Hare brought home by Mr. Vigne, (which, it is necessary to state, does not belong to the same

individual as that from which my description is taken), much more closely approximates in size to the skull of the Rabbit than to that of the Common Hare; in the comparative breadth of the palate, the larger size of the nasal bones, and of the incisive opening, and the greater space between the sphenoid alæ, as well as in the form of the anterior molar tooth, however, it will bear a closer comparison with the Hare's skull than with that of the Rabbit. From the skull of the Common Hare, or from that of the *L. variabilis*, it differs in having the interorbital space considerably more contracted, the raised platform, formed by the supraoccipital bone, narrower and more elongated, the basi-occipital bone distinctly more contracted in the middle, and the auditory bullæ larger[1]. The skull is narrower, and the nasal bones are more elongated than in *L. variabilis*, but in having a very small antero-posterior diameter to the palatine bone, *L. Tibetanus* agrees with the last mentioned animal. The incisive opening is very nearly the same in both.

	Inches.	Lines.
Length of skull	3	4
Width of ditto	1	7½
" between orbits		11¼
Length of nasal bones	1	5
Width of ditto behind		8
" " in front		6¾
From superior incisor to foremost molar ...	1	0¼
Length of the six molars taken together ...		6¼
" of palate		3
" of lower jaw	2	5
Height of ditto	1	6

Lepus Oiostolus. Hodgs.

"Fur, consisting almost wholly of wool, considerably curved, and interspersed rarely with very soft hairs; slaty grey-blue for

[1] The transverse diameter of the auditory bullæ is nearly 5¾ lines, whilst in the much larger skull of the *L. timidus* it is but 5 lines; in *L. variabilis* it is also 5 lines.

the most part and internally; but externally fawn-tinted above, and whitish below, and on the limbs; some hairs on the back tipped with black beneath a sub-rufous ring. Tail white, with a grey-blue stripe towards the back."—*Hodgs.*

Mr. Hodgson states that he had only been able to procure some "wretched remains" of this animal at the time that he drew up the above description. From these he was led to infer that the animal was about the same size as the *Lepus macrotus*—a species which is rather less than the Common Hare. The habitat given is, the snowy region of the Himalayas, and perhaps also Tibet.

In a subsequently published part of the Journal[1], already quoted, we are informed by Mr. Hodgson that the *L. Oiostolus* is common in Tibet, near the Hemâchal, but not so abundant in the central and eastern provinces of Utsâng and Khân, as the much larger species, *Lepus pallipes.*

A Hare in the British Museum collection, named *Lepus Oiostolus*, and presented by Mr. Hodgson, is evidently an extremely young animal. Whether it be the young of the *Lepus Tibetanus* I will not pretend to determine—its ears are similarly coloured.

Lepus pallipes.

Lepus pallipes. Hodgson, Journal of the Asiatic Society of Bengal, vol. xi. p. 288, with Plate. 1842.

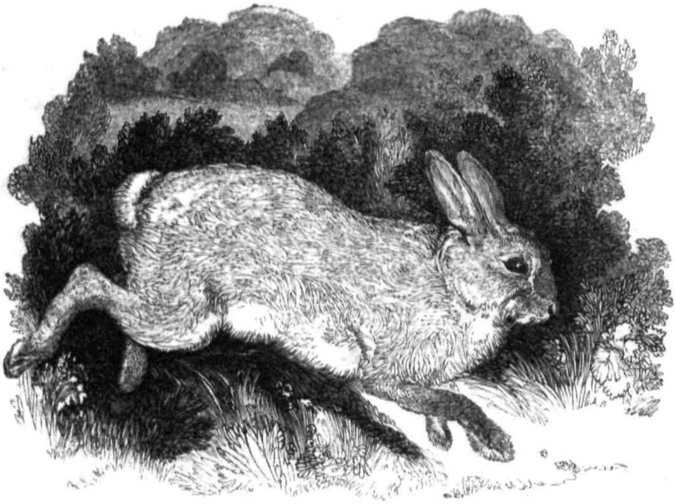
Fur long, dense, and soft; of a pale ochre colour, but, on the back of the animal, pencilled with black; haunches greyish; under parts white; chest of a delicate yellow-rufous tint; the front of the fore legs, and the fore feet, nearly of the same hue: tarsus almost white, but somewhat suffused with rufous in front: tail white, excepting along the middle portion of the upper surface, where it is grey.

Inhabits the central and eastern portions of Tibet.

[1] Vol. vi. p. 288. 1842.

In Mr. Hodgson's collection, presented by that gentleman to the British Museum, is an imperfect skin of the *Lepus pallipes*; one of those, I believe, upon which that gentleman's account of the species is drawn up. From this skin the above description is taken; the head being very imperfect, and destitute of ears, prevents my describing those parts, but Mr. Hodgson's description states that the ears are equal to the head in length, whilst the latter is said to measure 4¾ inches. The whole length of the animal, according to Mr. Hodgson, is from 22 to 23 inches, and the tail, without the hair, 4 inches, or, with the hair, 6 inches.

The general colouring of this animal agreeing very nearly with that of *Lepus Tibetanus*, combined with its habitat, would lead us to suspect the two animals were specifically identical, but the tarsus of *L. pallipes* being absolutely shorter, whilst the bulk of the animal is greater than in *L. Tibetanus*, causes me to hesitate in linking them together. There must, moreover, be a difference in the proportions which the ears bear to the head, in these animals.



LEPUS CUNICULUS.

The Rabbit, or Cony.

Lepus Cuniculus.	LINN., Syst. ed. 12, i. p. 72.
" "	DESM., Mamm. p. 348.
" "	JENYNS, British Vertebrate Animals, p. 35.
" "	BELL, British Quadrupeds, p. 348.
" *Magellanicus.*	LESSON et GARN. in Bullet. des Sci. Nat. viii. p. 96.
Rabbet.	PENNANT, British Zoology, i. p. 104, No. 22, t. x.
"	SHAW, General Zoology, ii. Pt. 1, p. 204, Pl. 164.
Le Lapin.	BUFFON, Hist. Nat. vi. p. 303, Tab. 50.
Kannichen.	KEYS et BLASIUS, Die Wirbelthiere Europas, i. 30.

Ears about equal to the head in length; tarsus short: general colour grey-brown; under parts white; back of neck rufous; tail white below, blackish above, but pencilled with dirty white.

Inhabits the southern and western parts of Europe, including the greater part of Germany; and occurs likewise in North Africa.

The Rabbit, or Cony[1], as it was more anciently called, is readily distinguished from the Hare, not only by its smaller size and greyish hue, but likewise by its comparatively short feet and ears, and the absence of the distinct black patch at the extremity of the latter. The short feet, indeed, distinguish this animal from very many of its congeners. Its burrowing habits have already been alluded to. Dry, sandy situations are the favourite haunts of Rabbits, but they by no means confine themselves to such spots, apparently having a constitution fitted to bear great variety both of soil and climate. The flesh being of good flavour, and the animal easily domesticated, it has been transported to various parts of the globe[2]. It is said to be originally from Spain.

The Rabbit is a very prolific animal, having several litters in a year, and bringing forth from five to eight young at a litter. Unlike the young of the Hare, these are at first blind and naked, but to compensate for their helpless condition they are amply protected by the warm and secure nest made by the parent, consisting as it does of fur from her own body, and being deposited at the bottom of a separate burrow formed for the purpose.

Like many other animals, when domesticated the Rabbit

[1] The word Rabbit is from the Dutch *Robbeken*, whilst that of Cony is from the Latin *Cuniculus*, and has its analogue, as Mr. Bell has pointed out, in many of the European languages. The Italian *Coniglio*, Spanish *Conejo*, Portuguese *Coelho*, German *Caninchen*, Danish and Swedish *Kaning*, Belgic *Konin*, and Welsh *Cwningen*, are clearly all from the same root.

[2] The Rabbit has been introduced into the Falkland Islands, and, according to Mr. Darwin (Journal of the Voyage of the Beagle, vol. iii. p. 248), these animals abound over large tracts of the eastern island. Black, grey, and piebald varieties are there found mixed together, and it is upon a black variety found in these islands that MM. Lesson and Garnot established the supposed species, *Lepus Magellanicus*. The animal does not occur, as these naturalists imagined, on the main land, near the Strait of Magellhaen: a small cavy (*Cavia Kingii*) there found being spoken of by Magellan under the name "Conejos," gave rise to the error.

is subject to much variety of colouring, and attains a large size. Black, white, and sandy-yellow, are the prevailing colours (as is also the case in the domestic Guinea-Pig), and wild Rabbits of the latter colour are occasionally met with. A silvery-grey domestic variety—the tint being produced by the hairs being party-coloured white and black—is known in England by the name *Silver Rabbit,* and is the "var. B. *Lepus cuniculus argenteus*" of Desmarest. Another variety, remarkable for the length and softness of its fur, known to us under the names *Russian Rabbit*, and *Angora Rabbit*, is the "var. C. *L. cuniculus angorensis*" of the same author.

Angora Rabbit.

Besides these, our Lop-eared Rabbits should be noticed, as being among the more striking of the domestic varieties. These animals are sometimes of enormous size, as compared

with the wild Rabbit, and are remarkable for having the ears more or less bent downwards from the base[1].

The general hue of the wild Rabbit is grey-brown; the hairs on the back are greyish white at the root; above this they are grey, then pale brown, shaded through darker brown into dusky, followed by a ring of sandy white, and a black point. The under parts of the body are white, but the fur on these parts is grey next the skin: the chin and throat are also white, as well as the region of the angle of the mouth. The back of the neck is rufous; the ears brown-grey externally, towards, and at the fore part; of a paler hue on the hinder part, and darker towards the point, which is edged with black; the hairs on the inner surface of the ears are for the most part greyish white, but assume an ashy-brown hue towards the hinder margin; the flesh of the ear is of a bluish white colour. The admeasurements of an average sized individual are as follows:

	Inches.	Lines.
From tip of nose to root of tail	16	6
" " to ear	3	4
Length of ear	3	1
Width of ditto	1	9
Length of fore leg and foot, from the elbow	4	9
" of the fore foot and nails	2	1
" of the hind leg and foot, from the knee	6	10
" of the foot	3	11
" of the tail, including the hair ...	3	0

Among the more striking differences which present themselves upon comparing the skull of the Rabbit with that of the Hare, may be noticed the comparatively contracted form of the muzzle and interorbital space in the former; and the

[1] These are known to the fanciers by the names, Horn-lop, Half-lop, Oar-lop, and Perfect-lop.—See Bell's British Quadrupeds, pp. 351 and 2. In the latter page is a vignette, in which these varieties are represented.

incisive openings are consequently narrow; the post-palatal channel is also considerably narrower in proportion in the Rabbit than in that of the Hare.

Two skulls of the Lop-eared variety of the domestic Rabbit, in the British Museum collection, are about four times larger than those of the wild race, but they retain the characteristics of the species; the *general* proportions being the same. The bones of these skulls want the compact texture observable in those of the wild animals, being coarse and spongy—many of them very rough and full of perforations—and there is a general want of symmetry. The bones which enclose the brain are very thick, so that, notwithstanding their superior magnitude, the brain cavity in these skulls is apparently but little larger than in the wild Rabbit. The teeth are not large in proportion to the skull, the molars being, in fact, but little larger than those of the wild animal, and they are absolutely smaller than in the skull of the Wild Hare, whilst the skulls of the Domestic Rabbit under consideration are much larger than the Hare's skull. These skulls measure respectively 4 inches 5 lines, and 4 inches 7 lines, in length; and both of them, 2 inches in width.

The subjoined dimensions are from skulls of the Wild Rabbit; those in the two last columns are from specimens obtained in a small island near the coast of Tunis: the remainder are from English specimens.

These skulls, it will be perceived, are smaller than those of English specimens—one of them is very small; but their proportions appear to be exactly the same, judging by the eye. Mr. Fraser, who brought these skulls, together with skins of the animals, to England, likewise found the Rabbit on the main land, at Tunis.

	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Total length of skull	3	1	3	1¼	3	0½	2	11	2	8⅔
Width	1	6¾	1	6⅔	1	6¼	1	5½	1	5
" between orbits		8		9¼		8		8⅔		7¾
Length of nasal bones	1	5⅓	1	6	1	5	1	3	1	1⅔
Width of ditto behind		6⅔		7¼		7		6⅓		5¾
" " in front		5½		5¾		4¾		4⅔		4¼
From upper incisors to molar teeth ...		11½		11¾		11		10		9
Length of six upper molars, taken together		6⅔		6¾		6¼		6½		6¼
" of incisive opening		9½		9¾		9¼		9		8¼
Width of ditto behind		3⅔		3⅓		3¼		3		2¼
" of post-palatal channel		2⅓		2⅓		2		1⅚		1⅚
Length of lower jaw	2	2	2	2½	2	2	2	0⅓		
Height of ditto	1	4	1	4	1	3¾	1	3		
Transverse diameter of angular portion		10½		10⅔		10¾		10		

LEPUS BRACHYURUS.

The Japan Hare.

Lepus brachyurus. TEMMINCK, in Siebold's Fauna Japonica, Pl. 11.

Ears small; shorter than the head: tail very short; brown, with the upper surface dusky: general hue of the animal rufous brown; throat white; abdomen rufous white.

Inhabits Japan.

A very distinct species of Hare, but approaching, in some respects, the Black-necked Hare of India; its ears, however, are much smaller, and it differs in its general colouring, as well as in the want of the black back to the neck. The head is more uniformly coloured than in most Hares, there being neither any white cheek mark, nor any white round the eye. The fur on the back of the neck is of the same general hue as that of the back, the hairs being pencilled in the same manner.

The fur of the Japan Hare is short, its texture is moderate (less harsh than in *L. nigricollis*), and its colouring, at a little distance, appears more uniform than most other Hares. This arises from the fur being very finely pencilled with brownish and pale rufous, instead of the exposed ends of the hairs having a long space of pale colour, and an equally extended space of black, as is more commonly the case, and which gives the mottled appearance to the fur of those species which have the hairs thus coloured. The fur is of an ashy-grey tint next the skin, excepting on the abdomen, where the hairs are uniformly coloured. The head is short, and the ears are unusually small; the latter are of the same general tint as the body, but at the apex they are narrowly margined with brown-black internally; externally they are also brown-black at the point, but here the black is more extended, and a narrow black line runs down the outer margin so as to occupy two-thirds of the length of the ear. Four specimens which have come under my notice (three in the Leyden Museum, and one in the British Museum), have a white spot on the crown of the head. The hind feet are of a richer rufous brown than other parts.

	Inches.		Lines.
Length from tip of nose to root of tail ...	20	—	0
" from ditto to ear, about	3	—	7
" of ear	2	—	10
Width of ditto	1	—	9
Length of tail, including the fur, about ...	2	—	0
" of the hind foot and nails	4	—	10

The skull of the Short-tailed, or Japan Hare, is remarkable for the small size of the supra-orbital process; the notch in front of this process is very small; the palate is longer than usual, and the antero-posterior diameter of the palatine bone, and that of the palatine portion of the superior maxillary, are more nearly equal. All the bones of the skull display more than common strength, arising from the comparatively large size of the teeth. The molars and incisors are fully as large as those of the Common Hare, although the skull is very much smaller. The lower jaw is short and strong, and the coronoid process is less elevated than in most Hares.

	Leyden Museum.		British Museum.	
	Inches.	Lines.	Inches.	Lines.
Length of the skull to the hinder margin of the parietal bones	3	5	3	1?[1]
Width of ditto	1	$8\frac{1}{3}$	1	7
Length of nasal bones	1	6		?
Width of ditto behind		9		$8\frac{1}{4}$
" " in front		7		$5\frac{3}{4}$
" between orbits	1	$0\frac{1}{2}$		$9\frac{1}{2}$
From upper incisors to the molar teeth	1	$0\frac{2}{3}$	1	0
" incisors to hinder margin of palate	1	5	1	4
Antero-posterior diameter of palate ...		4		$3\frac{2}{3}$
Length of the six upper true molars taken together		$7\frac{1}{2}$		$7\frac{1}{2}$
Width of upper incisors		3		3
Length of lower jaw			2	$3\frac{1}{2}$
Height of ditto			1	4
Transverse diameter of angular portion				$11\frac{1}{2}$

This completes the list of the Europeo-Asiatic species of Hares: we shall now proceed to the

[1] The whole length of of the perfect skull would no doubt be *very* nearly 3″ 4‴.

Indian Hares.

LEPUS NIGRICOLLIS.

Black-necked Hare.

Lepus nigricollis. F. Cuvier, Dictionnaire des Sciences Naturelles, tom. xxvi. p. 307, 1823.—(*Lièvre à cou noir*), Mammifères, No. 69. 1837.

" " Is. Geoffroy, Dict. Classique d'Hist. Nat. ix. p. 386. 1826.

" " Ogilby, in Royle's Illustrations of the Botany, &c. of the Himalayan Mountain, vol. i. p. lxviii. 1839.

" " Wagner, Schreb., Säugth. Suppl., iv. p. 88, Pl. 233 f. 1844.

" *melanauchen.* Temminck, Discours Préliminaire, &c. in Siebold's Fauna Japonica, p. xiii. 1835.

" *Kurgosa* (The Sassa or Khargosh). Gray, in List of the Mammalia in the Collection of the British Museum, p. 128. 1843.

Ears rather shorter than the head: fur rather short, and harsh; on the upper parts of the body mottled with black and rufous yellow; the back of the neck sooty black; chin and throat white; ears black at the apex externally, and yellow-white at the point internally: abdomen white, suffused with rusty yellow; feet rufous yellow: tail white beneath, and pencilled with black and pale rufous above.

Inhabits Java and the Mauritius, and likewise continental India—Bengal, the Deccan, and Carnatic.

Upon comparing my descriptions taken from F. Cuvier's *Lepus nigricollis*, in the Paris Museum, and from the *Lepus melanauchen* of M. Temminck, in the Leyden Museum, I find them to agree so closely as to leave no doubt on my mind as to the specific identity of these animals; the *L. Kurgosa*[1] of the British Museum collection is also clearly the same species.

The Black-necked Hare is well named by M. F. Cuvier,

[1] Mr. Gray quotes this name (it should be *Hurgosa*) from Buchanan's Mysore, i. p. 169. I find no description of the present animal in this work. The name *Lepus Hurgosa* merely occurs in a list of game animals.

for I am acquainted with no other species in which the back of the neck is black. The harsh and short fur is mottled, or strongly pencilled, with black and sandy yellow on the whole of the upper parts, if we except the occiput and back of the neck, which are sooty black; the sides of the body are of a brownish hue, or sometimes inclining to grey; the under parts white, but suffused more or less with rufous yellow; the chest, and foot of the fore leg, are rufous, as are likewise the hind feet, but these latter are very pale; the hind legs externally are greyish, and internally whitish: the orbit of the eye, the chin, and the throat, are white; the ears are brownish on the inner surface, but fringed with white, and margined with yellow-white at the apex; on the outer surface they are grizzled with black and yellow on the fore part, whitish on the hinder, and edged with black at the point: the tail is white beneath, dusky above, and generally more or less pencilled with rufous or yellow on this part.

	Leyden Museum. From Java.		Paris Museum.	
	Inches.	Lines.	Inches.	Lines.
Length from nose to root of tail ...	19	9	18	0
" " to ear	3	6	3	3
" of ear	3	4	3	6
Width of ditto	1	10		
Length of tail, with the fur, about	3	9		
" of tarsus	4	1		

With regard to the skull of this species, I may observe that the supra-orbital processes are smaller than in the generality of the Hares (in this respect resembling the Japan Hare), and the interorbital space is narrower. The nasal bones are rather long. The upper incisor teeth have each two longitudinal grooves, placed very closely together, and not very distinct; the inner half of the tooth projects so as to form a somewhat prominent ridge. The following admeasurements are taken from two skulls of the *L. nigricollis* in the Leyden Museum, and are from Java specimens.

	Inches.	Lines.	Inches.	Lines.
Total length of skull	3	5	3	5
Width	1	6¼	1	6½
" between orbits		9		
Length of nasal bones	1	5½	1	5
Width of ditto behind		8		9
" " in front		6		6
From upper incisors to molar teeth ...		11½		11¾
Length of six upper molars taken together		6½		6½
Antero-posterior diameter of palate ...		3		3
Length of lower jaw	2	4¾	2	5½
Height of ditto	1	5	1	6
Transverse diameter of angular portion		11½	1	0

LEPUS RUFICAUDATUS.

Rufous-tailed Hare.

Lepus ruficaudatus. Is. Geoffroy, Dictionnaire Classique d'Histoire Naturelle, tom. ix. p. 381 (1826); in Bélanger's Voy. aux Indes Orientales, Zoologie, p. 156 (1834); Guérin's Magaz. de Zoologie, 1832.

" " Ogilby, in Royle's Illustrations of the Botany, &c. of the Himalayan Mountains, vol. i. p. lxix. (1839).

" *macrotus.* Hodgson, Journal of the Asiatic Society of Bengal, vol. ix. p. 1183 (1841).

Ears longer than the head: fur short, and somewhat harsh to the touch; on the upper parts of the body strongly pencilled with black and brownish rufous; on the under parts, white, suffused with bright rust colour; chest, back of neck, and limbs, for the most part of a brownish rust colour: ears margined with yellowish internally at the apex, and with black externally, the black running down the posterior margin: tail rufous above; white below.

Inhabits the northern parts of India, the plains of the Ganges, extends into Nepal, and westward to Delhi.

Lepus ruficaudatus is the Common Hare of the northern parts of India, and is apparently replaced in the south by the Black-necked Hare: it greatly resembles the common European species, but is rather smaller, and has the hind feet proportionately shorter; the colouring of the ears and tail, moreover, furnish distinguishing characters, the former being destitute of the black patch on the inner surface of the apical portion, whilst the tail differs in having its upper surface of a brownish rufous tint. Its fur is shorter than in the *L. timidus*, and somewhat harsh to the touch; on the upper parts of the body it is strongly pencilled with black and brownish rufous; the sides of the body assume a more uniform tint, being but little pencilled with black, and on the haunches a greyish tint is perceptible. The hairs on the back are of a very pale grey tint at the root; beyond the grey, each hair assumes a pale rufous tint, which is followed by a broadish black ring, then a less extended space of brownish rufous, and lastly black, which is the colour of the point. On the abdomen the fur is white, but the exposed ends of the hairs are generally more or less tinted with a rusty yellow colour. The chest, back of the neck, and the limbs (for the most part) are of a brownish rust colour; the fore legs, however, of a brighter hue than the hinder. The chin, throat, and orbit of the eye, are white, and the white is considerably extended immediately in front of the eye. The ears are long, rather sparingly clothed, have the posterior edge white, the fringe in front composed of white and yellow hairs, and the apex rather broadly margined with yellowish: this applies to the inner surface of these organs; externally they are margined at the extremity with black, and a black line runs about halfway down the hinder margin, commencing at the apex of the ear. The tail is white below, and its general hue above is brownish rufous; but there is an admixture of black hairs on this part.

I have seen specimens from the mountains which are of a paler hue than those of the plains.[1] The dense fur on the under surface of the feet is generally of a dirty brown hue; a specimen in the British Museum, however, has the under parts of the feet of a deep red colour.

To the admeasurements contained in the two first of the subjoined columns are added some dimensions given by Mr. Hodgson, and which are, no doubt, taken from fresh specimens :—

	Dark var.		Pale var.		From the Plains. Male.		From the Plains. Male.		Hills. Female.	
	Ins.	Lns.	Ins.	Lns.	Ins.	Lns.	Ins.	Lns.	Ins.	Lns.
Length from tip of nose to root of tail	22	0	19	6	18	0	18	0	19	0
" from nose to ear ...	3	9	3	10						
" of ear	4	4	4	4	4	9	4	9	5	0
Width of ditto	2	7	2	6						
Length of tail with the fur ...	4	6	4	6	7	10½	5	0	5	0
" without the fur ...	—		—		3	6	3	7½	3	7⅓
" of hind foot and nails ...	4	8	4	7						
From elbow to wrist	—		—		3	8	3	7½	3	8
" wrist to end of foot, including the nails	—		—		2	0	2	0	2	1
Length of tibia	—		—		4	10½	4	11⅓	5	0⅔

[1] A specimen of the Rufous-tailed Hare in the museum of the Zoological Society, and which is labelled as coming from the Himalaya, is considerably

According to Mr. Hodgson this species of Hare weighs from five to seven pounds.

The skull of *Lepus ruficaudatus* is rather smaller than that of the Common Hare, has the nasal bones narrower, especially in front; the supra-orbital processes less developed, the zygomatic arch less deep, and the post-palatal channel narrower. There is a distinct crest, in adult skulls, at the union of the parietal bones, and the crest is continued forwards for some little distance on to the frontals. In the structure of the superior incisor teeth there exists a tangible distinctive character between the present species and the Common Hare. In this latter animal the antero-posterior diameter of the incisor is equal, or *very* nearly equal, whether taken near the outer or the inner side of the tooth, whilst in *L. ruficaudatus* there is a very distinct decrease in the diameter of the tooth in passing from the inner to the outer edge; and, moreover, the superior incisor in the Indian Hare has the external groove less deep, and placed nearer to the inner edge of the tooth, which is sharp and prominent. Sometimes there are two parallel grooves, placed closely together. The lower jaw differs, in having relatively less space between the incisor and molar teeth, and the horizontal ramus thicker, and presenting a distinctly convex outline below the molars, instead of being straight at that part, as in *L. timidus;* the angular portion of the jaw descends less, but has a proportionately greater transverse diameter.

paler in its general tint than a second individual in the same collection, presented by Mr. Hodgson, and which is probably from the Sub-Himalaya. In the British Museum collection the darker and paler (greyish-brown) varieties will also be found, being presented by the zealous and public-spirited naturalist just mentioned, to whom we are indebted for most of our information relating to the animals of Nepaul.

	Ins.	Lines.	Ins.	Lines.
Length of skull	3	8	3	8
Width	1	8½	1	8
" between orbits	1	1	1	0
Length of nasal bones	1	7½	1	6⅔
Width of ditto behind		10		10
" " in front		7		7
From upper incisor to molar teeth	1	0¼	1	0¾
Length of six molar teeth, taken together		7⅓		7⅓
Antero-posterior diameter of palate		3⅜		4
Width of post-palatal channel ...		3⅔		4
Length of lower jaw	2	6½	2	6½
Height of ditto	1	4¾	1	5⅓
Transverse diameter of the angular portion	1	2½	1	2⅓

LEPUS HISPIDUS.

Assam Hare.

Lepus hispidus. PEARSON, in Bengal Sporting Magazine for August, 1843, p. 131.

Carpolagus hispidus. BLYTH, Journal of the Asiatic Society of Bengal, No. 160 (76 of New Series), p. 247, with Plates. 1845.

Ears much shorter than the head; fur harsh, on the upper parts of the body pencilled with black and yellow-brown; on the lower parts paler, and inclining to white; toes yellowish white: tail reddish, excepting at the root beneath.

According to Mr. Blyth, who has given a detailed description of this animal in the work above quoted, its length, measured in a straight line, is about fifteen inches and a half; the ears two inches; the tail, with the hair, scarcely an inch and a half; the tarsus, to the end of the nails, three and three quarter inches; the length of the skull also three inches and three quarters. The head is large, and the eyes small; the whiskers slender, and by no means conspicuous; the ears are

very short as compared with those of most other species, as is likewise the tail; the limbs small, and less unequal in length than usual; the claws straight, sharply pointed, and remarkably strong. The fur is remarkable for an animal of the Hare section, on account of its harshness, but this harsh texture is due to the longer hairs of the fur only, the under fur being soft: this latter is of an ashy hue, whilst the outer fur consists of hairs, some of which are annulated with black and yellowish brown, whilst others (which are longer) are entirely black and glossy. On the under parts of the body the fur is paler, being of a dingy white tint. The fur of the tail is soft, and of a rufous tint throughout, with the exception of the basal part beneath.

Beyond these points Mr. Blyth draws attention to some peculiarities observable in the skull, which that gentleman remarks "is much more solid and strong than in any *Lepus*, with every modification that should contribute to increased strength, but upon the same subtypical model of confirmation: dentition also similar, but the grinders broader and more powerful, and the incisors proportionably much larger. The palatal foramina are reduced, so that the bony palate is as long as broad; the ant-orbital foramina are nearly closed by obliquely transverse bony spiculæ, corresponding to the open bony network observable in *Lepus*. The nasal bones are broad, with an evenly arched transverse section, and are less elongated backwards than in the true Hares; the maxillaries and intermaxillaries corresponding to their greater width and solidity. The zygoma fully twice as long as in *Lepus*; the supra-orbital processes continued forwards uninterruptedly, the anterior emargination, seen in the Hares, being quite filled up with bone, while the posterior is also much less deep."

These aberrant modifications found in the skull of the Assam Hare, combined with certain other peculiarities of the animal already pointed out, have induced Mr. Blyth to

remove it from the genus *Lepus*, and to found upon it the new genus *Carpolagus*. Strongly marked, however, as these distinctions are, if the Assam Hare be compared with the Common Hare, they are less so when that animal is compared with the Indian Hare (*Lepus ruficaudatus*), and *much* less so, when it is compared with the *Lepus brachyurus* of Japan. This last mentioned animal has the short ears and tail of the *Lepus hispidus*, and the same large molar, and incisor teeth, combined with a powerfully formed skull, but in this skull the notch which sets free the fore part of the supra-orbital process, is not absent, as in *Lepus hispidus*: it agrees in having the patch unusually long, but differs from the skull of *L. hispidus* (as it would appear from Mr. Blyth's figures) in having the zygomatic arches straight and parallel as in other Hares; the Assam species having the zygoma somewhat arched outwards. The peculiarities which I have pointed out as distinguishing the lower jaw of the *Lepus ruficaudatus* from that of the *L. timidus*, are also found in the lower jaw of *L. hispidus*, but here the angular portion has a still greater transverse diameter.

The specimen upon which Mr. Pearson drew up his description, and founded the present species, was killed on the right bank of the river Teestah, close under the Saul Forest, and about six miles north of Jalpee Goree. In this place the animal is said to be rare, but towards the hills it appears to be found in greater abundance. There are reasons to believe the animal burrows.

Lepus Sinensis.

Lepus Sinensis. GRAY, Illustrations of Indian Zoology.

Of a species of Hare which inhabits China, a well executed figure will be found in the work above quoted. It represents an

animal about fourteen or fifteen inches in length, with ears of the same length as the head, and pale on the inner surface, to the point; the body of a rich rufous colour, but much suffused with black on the back, and the tail with the lower surface white, and the upper, partly black and partly rufous. Beyond these points, gleaned from the figure mentioned, I am unable to furnish any further particulars, excepting that the fur of the animal, as Mr. Gray informs us, was very harsh.

Hares of Africa, Arabia, and Syria.

Of the several species of Hares described as natives of the northern parts of Africa, as well as of Syria and Arabia, two only have come under my notice, namely, the Egyptian Hare, and the Isabelline Hare; the former has a palish but mottled colouring, and the latter is almost of an uniform delicate fawn yellow; both are much smaller than the Common Hare, and are remarkable for having very large ears. The remaining species are described by Ehrenberg, and do not appear to be generally known, excepting by the descriptions. One other species must be included in the North African Fauna, the *Lepus Mediterraneus*, which is already described amongst the European species, since it occurs in Sardinia as well as in North Africa.

LEPUS SYRIACUS.

Syrian Hare.

Lepus Syriacus. Hempr. et Ehr. Symbolæ Phys. Mamm. Pt. ii. Pl. xiv. fig. 2.

Head and tail short; limbs long; ears about one-third longer than the head: fur somewhat harsh, its general hue yellowish, but on the upper parts of the body variegated with black:

parts of the feet, rufous: ears brownish ash-colour, margined with white and black at the tip.

	Inches.	Lines.
Length from tip of nose to root of tail ...	20	5
" from ditto to the hinder part of the root of the ear	4	7
" of tail, with the fur	3	7
" of ditto, without the fur ...	3	0
" of ear	5	$4\frac{3}{4}$
" of fore foot and nails	2	$1\frac{1}{2}$

The author has never met with this species of Hare in the collections which he has visited.

LEPUS ARABICUS.

Arabian Hare.

Lepus Arabicus. HEMPR. et EHR. Symbolæ Physicæ, Mammalia, Part 2.

Head and ears elongated, the latter one-fifth longer than the head; tibiæ long; tarsi about equal to the head in length; teeth stout: fur ashy grey, or tawny, variegated with black and rufous; on the under parts of the body white; back of the neck tawny yellow; ears immaculate: tail white, with upper surface brown black.

Inhabits Arabia.

The Hares which inhabit the opposite coasts of the Red Sea, Ehrenberg observes, have a great affinity with each other, but present certain points of distinction, and hence have been regarded as species, but more complete observations are required to determine the value, or importance, of the differences noticed. The present species was met with at Confodah (a little south of Mecca), and likewise in Arabia Felix, near Toheia.

The fur on the upper parts of the body, in the Arabian

Hare, is ashy white at the root, and each hair is brown in the middle, has a subterminal, broad yellow-white ring, and a blackish, ashy, or rufous point; the longer interspersed hairs are entirely black, excepting at the root, which is greyish. The general hue of the upper parts is ashy grey, but with white pencillings; the back of the neck is pale yellow. A white mark passes through the eye, and the throat and abdomen are white. The ears have no black patch at the extremity; their anterior surface is ashy grey, whilst the hinder external part is paler; the apex is margined with black; the inner surface yellowish. The feet are brownish yellow, but assume a paler hue at the extremities of the toes; the fur on their under parts is brown. The tail is brown-black above, and white beneath.

The fur was short in the specimens examined by Ehrenberg, arising, it is supposed, from their being killed when changing their winter, for the summer fur.

The following dimensions (as well, indeed, as the other parts of this description), are taken from the "Symbolæ Physicæ," of MM. Hemprich and Ehrenberg, the author having had no opportunity of examining the animal.

	Inches.	Lines.
Length from tip of nose to root of tail ...	22	0¾
" from ditto to the hinder part of the root of the ear	4	6
" of tail, including the fur	3	3½
" of ditto, without the fur	2	2⅓
" of ear	5	5
" of fore foot and nails	1	11¼
" of hind foot	4	5

LEPUS ÆGYPTIUS.

Egyptian Hare.

Lepus Ægyptius. GEOFFROY, Description de l'Egypte, Hist. Nat. tom. ii. p. 739, Atl. Pl. 6, fig. 2 (1812).

Lepus Ægyptius. DESM. Mammalogie, Part ii. p. 350.
" " EHRENBERG, Symbolæ Physicæ, Pl. 15, fig. 1.
" " WAGNER, SCHREB. Säugth. Suppl. iv. p. 90.

Ears much longer than the head; fur moderately long, and soft, its general hue ashy yellow; on the upper parts of the animal mottled with black; chin, throat, and abdomen, white; ears rather broadly margined with black externally, at the apex; tail white, with the upper surface black.

Inhabits Egypt.

The Egyptian Hare is considerably smaller than the common species; has proportionately larger ears, and its general hue is paler. It appears to be found throughout Egypt, and we are informed by Messrs. Hemprich and Ehrenberg, that it confines itself chiefly to the deserts, being rare in the fields. It is a delicately made animal, and having long legs, and especially a long hind foot, we should imagine, was very fleet. Its soft and moderately long fur is of a grey-white hue next the skin, on the upper parts of the body, and here the hairs have a sub-terminal broad cream-coloured ring, below which is a broad dusky grey space, and above the pale ring they are blackish. The chin, throat, and abdomen, are white: the chest, of a very pale dirty yellowish hue. The orbit of the eye is whitish: the ears, which are large, are clothed with pale hairs internally, and have a yellow-white fringe on the anterior margin; externally they are of a yellowish ash colour in front, white behind, and rather broadly margined with black at the apex. The back of the neck is pale rufous, but whitish immediately below the ear: the legs are very pale, inclining to white, but somewhat suffused with a dirty yellow tint.

	Leyden Museum.		British Museum.	
	Inches.	Lns.	Inches.	Lns.
Length from tip of nose to root of tail	19	9	18	0
" from nose to ear	3	2 ?	3	7
" of tail	3	6	4	4
" of ear	5	0	5	6

	Leyden Museum. Inches.	Lns.	British Museum. Inches.	Lns.
Width of ditto	2	11	2	11
" of fore leg and foot ...			6	0
" of fore foot			2	0
" of tarsus	4	6	4	3

	Inches.	Lines.
Length of skull		?
From the anterior extremity to the posterior root of the zygoma	2	6
Width	1	8¼
Length of nasal bones	1	3½
Width of ditto behind		9¼
" " in front		6¾
" of interorbital space	1	0¾
Between incisors to molar teeth		11
Length of palate		3¼
" of six true molars, taken together		6½
Width of second upper true molar ...		2½
" of upper incisors		2⅝
Length of lower jaw	2	6¼
Height of ditto	1	6¼
Transverse diameter of angular portion ...		11

Of this species I have examined the specimens in the Paris and Leyden Museums, as well as those in the British Museum. Those in the Leyden Museum were procured in Egypt by Dr. Rüppell. The feet in the Egyptian Hare are more densely clothed with fur than in the *L. isabellinus*.

Lepus Habessinicus.

Lepus Habessinicus. Hempr. et Ehr. Symb. Phys. Mamm. Part ii. Plate 15, fig. 2.

Ears about equal to the head in length; tarsi rather longer than the ears, muzzle in adult animals rather arched: upper parts of the body brownish ash colour, finely pencilled with black, under parts white; ears externally with a black patch at the extremity.

Inhabits Abyssinia.

It would appear from Ehrenberg's description, from which this account is taken, that the Abyssinian Hare approaches the Egyptian species in size, but differs in having the ears comparatively shorter, and the muzzle more arched. It is stated to be of a brownish ash colour on the upper parts of the body, and pencilled with black on these parts; yellowish on the back of the neck; white on the under parts of the body as well as on the throat; an indistinct white mark passes through the eye; the ears are of a brownish ash colour, with a large blackish patch at the apex externally, about three quarters of an inch in depth; the fringe of the ear, as well as the posterior margin, white, and there is a white patch at the base of this organ externally. The feet and chest are yellowish.

	Inches.	Lines.
Length from tip of nose to root of tail	20	5
" from ditto to back of ear ...	4	0¼
" of tail, with the fur	3	10
" of ditto, without the fur ...	2	9
" of ear	4	2½
" of hind foot	4	3⅔

LEPUS ISABELLINUS.

Nubian Hare.

Lepus isabellinus. CRETZSCHMAR, Atlas zu der Reise im Nordlichen Africa von Rüppell, p. 52, Pl. 20 (1826).
" " WAGNER, Schreb. Säugh. Suppl. iv. p. 95, Pl. 233, D.
" *Æthiopicus.* HEMP. et EHRENB. Symbolæ Physicæ, Mamm. ii. Pl. 13 (1832).

Form slender; limbs moderately long; ears about one-third longer than the head: fur moderate, its general hue fawn yellow; on the back slightly pencilled with black, under parts of the animal white; ears margined with black at the apex externally: tail white below; partly brown-black, and partly yellow above.

Inhabits Nubia.

An elegant little Hare, discovered by Dr. Rüppell, the enterprising Abyssinian traveller, who states that it frequents districts which are overgrown with shrubs, and is common in the Steppes south-west of Ambukol (on the Nile 18° N. lat.), where it is hunted with greyhounds: it extends southwards into Sennaar, but in Abyssinia is replaced by another Hare, which, by Cretzschmar, is regarded as specifically identical with the Egyptian Hare, but which, according to Ehrenberg, forms a third species, and is described by that author under the name *Habessinicus*.

The Nubian Hare is readily distinguished from its congeners by its almost uniform delicate fawn yellow colouring, combined with a small stature, very large ears, and slender and moderately long legs. The fur on the back of this animal is of an ashy-white colour next the skin; each hair is brownish in the middle, and has the exposed end of a pale yellow tint; the longer and coarser hairs are black at the point. On the back of the neck, chest, and sides of the body, there is no black pencilling; the former parts are slightly tinted with rufous, but on the back of the neck it is chiefly in the mesial line that this hue is visible; for immediately behind the ears, and for some distance backwards from that point, the fur is whitish. The throat and abdomen, as well as the orbit of the eye and inner surface of the limbs, are white; the tail is white beneath, sometimes faintly tinged with yellow; and above, it is brown-black along the mesial line, but yellow at the sides: the dense fur on the soles of the feet is of a rufous colour. The ears have the external and internal bands of the same yellow hue as the body; the fringe on their anterior margin is yellow-white, and the hinder margin is edged with pure white; on the inner surface the ears are margined with yellow at the apex, and on the outer, they are rather broadly margined with black.

The above description is taken from a specimen in the

British Museum, which was sent from Sennaar. This specimen agrees most closely (as I perceive, upon comparing my notes) with specimens in the Paris and Leyden Museums. Two specimens in the last-mentioned Museum were received from Dr. Rüppell.

	Brit. Mus.		Paris Mus.		Leyden Mus.		From Ehrenberg.			
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length from tip of nose to root of tail .	17	6	18	0	19	0	19	7	16	2
" from nose to ear, about ...	3	2	3	4	3	1	4	1½	3	10[1]
" of ear	4	6	4	8	5	0	4	7	4	2½
Width of ditto	2	9			2	10				
Length of fore leg and foot, about ...	5	3								
" of the fore foot and nails ...	1	9							1	11
" of the hind foot and nails ...	4	0			4	1	3	10	4	1½
" of the tail, including the fur, about	3	6			4	0				
" of ditto, not including the fur .							2	7	2	3½

Upon comparing the skulls of *Lepus Ægyptius* and *L. isabellinus*, in the Leyden Museum, I found much general

[1] Here measured to the *back* of the ear, my own measurements were taken to the fore part of that organ.

resemblance between them ; they have the nasal bones rather short and very flat behind. The skull of *L. Ægyptius* was rather larger than that of *L. isabellinus*, and had a greater antero-posterior diameter to the palatine bone ; the incisor teeth, moreover, were proportionately broader. The upper incisors in both animals had each a double groove, the grooves being placed closely together. The following are the dimensions of the cranium of the Isabelline, or Nubian Hare.

	Inches.	Lines.
Length of skull to the hinder margin of the parietal bones	2	3½
Width of ditto	1	6
Length of nasal bones	1	2¾
Width of ditto behind		8½
" " in front		6
" of interorbital space		11
From back part of upper incisor to molar teeth		10¾
" ditto to hinder margin of palate... ...	1	2
Antero-posterior diameter of palate		2⅔
Length of six upper molar teeth, taken together		6¼
Width of upper incisors		2½
Length of lower jaw	2	3¼
Height of ditto	1	6
Transverse diameter of angular portion ...		10½

Hares of South Africa.

Much confusion has arisen with respect to the Cape Hares; many nominal species have been formed, and one of the species has been very generally confounded with the Egyptian Hare. Having fortunately had an opportunity of examining most of the specimens upon which the various species have been founded, I have been enabled to satisfy myself that there exist in South Africa, three well-marked species of Hares, perfectly distinct from those of other parts, and easily distinguished from each other. Two of these are very

nearly equal in size to the Common Hare (*L. timidus*), and have very large ears, but one attains a larger size than the other, and has ears proportionately larger; has a rufous back to the neck, a white throat, and its limbs are of a brown-grey hue, as well as the sides of the body; this is the *L. saxatilis* of F. Cuvier. The second is distinguished from the first by the absence of the rufous tint on the back of the neck, by the limbs and sides of the body being of a more or less bright rust colour, and the throat yellow: this is the *Lepus Capensis* of F. Cuvier. The third is a small animal, about equal in size to the Common Rabbit (*L. Cuniculus*,) and is further distinguished from the large species, by its having short ears, and short feet and tail; by its deep red-brown colouring, and by the tail being for the most part of the same red-brown colour as the body, often more or less dusky, however, at the point; the tail in the larger species being white, with the upper surface black. This smaller species is the *L. crassicaudatus* of Is. Geoffroy.

According to the Leyden Museum, the first species is known to the Dutch colonists, by the name '*Berg-haas*' (or Mountain Hare); the second, is the '*Vlakte-haas*' (or Plain Hare) of the colonists; and the third is the '*Roode-haas*' (or Red Hare) of the Dutch settlers. Besides these, there is a very small Hare in the Paris Museum, upon which M. Is. Geoffroy established his *L. arenarius;* this I feel almost certain is a very young animal, and, moreover, I suspect it will prove to be the young of *L. Capensis*.

LEPUS SAXATILIS.

Rock Hare.

(*Plate* 1, Fig. 1.)

Lepus saxatilis. F Cuvier, Dictionnaire des Sciences Naturelles, Tom. xxvi. p. 309. 1823.

Lepus saxatilis. Is. Geoff. Dict. Classique d'Hist. Nat. ix. p. 382. 1826.
" *rufinucha.* A. Smith, Zoological Journal, Vol. iv. p. 440. 1829.
" *longicaudatus.* Gray, Magazine of Nat. Hist. Vol. i. (new series), p. 586. 1837.
" *fumigatus.* Wagner, in Schreb., Säugth. Suppl. vol. iv. p. 98. 1844.
Berg-haas of the Dutch colonists.

Ears much longer than the head; tail long: fur moderate; general hue grey-brown, on the upper parts of the body mottled with brownish black, and brown-white; under parts of body, white; back of neck, rufous; ears with a large blackish patch externally at the apex; internally fringed with black at the apex; tail black above, and white below, as well as at the point.

Inhabits the Cape of Good Hope—"rocky and mountainous situations."—Dr. A. Smith.

The Rock Hare of the Cape is about equal in size to the Common Hare, and is remarkable for the enormous size of its ears, and the comparatively great length of its tail. From the other Cape Hares it may be distinguished not only by its superior bulk, and the relatively greater size of its ears and tail, but likewise by the absence of any rufous tint on the limbs and sides of the body.

Dr. A. Wagner, in his able Supplement to Schreber's great work upon Mammalia, has recently described the present species under the name *Lepus fumigatus*, not without expressing a suspicion, however, that it might prove to be identical with F. Cuvier's *L. saxatilis,* the description of which he did not regard as sufficiently detailed to enable him to satisfy himself upon this point. My notes made upon M. Cuvier's animal in the Paris Museum, describe it as fully as large as the Common Hare, with the ears immensely large, and the general hue of the fur grey-brown—on the back of the animal mottled with black and brown-white; the back of the neck of a rusty

yellow tint; the abdomen and inner surface of the limbs, as well as the throat and orbit of the eye, white; the ears externally with the fore part clothed with party-coloured black and dirty white hairs, the hinder part whitish, and the apical portion black; internally for the most part clothed with dirty yellow-white hairs, but becoming blackish near the hinder margin, which is edged with white; the fringe on the anterior margin is composed of dirty yellowish hairs; fore legs pale brown; the tarsi mottled with pale brown and white; the dense fur on the soles of the feet dusky brown. Length $22\frac{1}{2}$ inches; ear, about $5\frac{1}{3}$ inches; nose to ear, about $4\frac{1}{12}$ inches,

The specimens in the British Museum and the Leyden Museum agree in all essential particulars with this description. In all, the back of the neck is of a palish rufous tint, and I may add that this hue extends on to the basal portion of the ears behind; they have the outer surface of the limbs of the same brown hue as the sides of the body; the tarsi brownish, more or less mottled with white; the upper lip, lower part of cheeks, orbit of eye, throat, abdomen, and the inner surface of the limbs, white; the ears brownish or dusky near the posterior margin internally; the remaining inner portions whitish, or, towards the point, yellowish; the fringe on the hinder margin is white, and that on the anterior margin is of a dirty yellowish colour; the apical third of the ear is fringed with black, and there is a large dusky patch on the apical portion of the ear externally. The fur on the back is of an ashy grey hue next the skin, and each hair is shaded through brown into brown-black, in the middle; has a broad subterminal brown-white ring, and a dusky point. On the chin there is sometimes a brown spot, and the throat is sometimes a greyish white. The tail is long, white below and at the point, and black above.

	British Museum. Inches.	Lines.	Leyden Museum. Inches.	Lines.
Length from tip of nose to root of tail	23	0	24	0
" from nose to ear, about ..	4	6	4	6
" of ear	6	10	7	0
Width of ditto	3	6	3	6
Length of tarsus	5	5	5	6
" of tail, including the fur, about	6	0	5	6

The skull of the *Lep. saxatilis* is considerably larger than that of *L. Capensis*, and a large lobe of the frontal bones is wedged in between the nasal bones behind. The following admeasurements are taken from a skull in the Leyden Museum.

	Inches.	Lines.
Total length of skull	4	2
Width of ditto	1	10
" between orbits	1	2
Length of nasal bones	1	9
Width of ditto behind	1	0⅓
" in front		8¼
Between upper incisors and molar teeth ...	1	3⅓
From ditto to hinder part of palate ...	1	7¼
Antero-posterior diameter of palate ...		3½
Length of the six upper true molars, taken together		7⅔
Width of upper incisors		3¼
Length of lower jaw	2	8½
Height of ditto	1	6
Transverse diameter of angular portion ...	1	0

LEPUS CAPENSIS.

Cape Hare.

Lepus Capensis. LINN. Syst. Nat. i. p. 76.

" " F. CUVIER, Dictionnaire des Sciences Naturelles, xxvi. p. 308. 1823.

" " IS. GEOFF., Dictionn. Classique d'Hist. Nat. ix. p. 382. 1826.

" *ochropus.* A. WAGNER, in Schreb. Säugth. Suppl. ii. p. 96. 1844.

? " *Capensis.* THUNBERG, Mammalia Capensia Recensita et Illustrata, in Mem. de l'Acad. Imper. des Sciences, de St. Pétersbourgh, vol. iii. p. 309. 1811.

? " *arenarius.* IS. GEOFF., in Dict. Class. d'Hist. Nat. ix. p. 383.

Ears distinctly longer than the head; tail rather long: general hue grey brown, distinctly mottled with black on the upper parts of the body; back of neck brown-grey; throat fawn yellow; sides of body, as well as the limbs, of a more or less bright rust colour; abdomen white, more or less suffused with rust colour.

Inhabits the Cape of Good Hope.

The Cape Hare bears considerable resemblance to the Common Hare (*L. timidus*), but may be distinguished by its *longer ears and tail, the brighter colour of its limbs, and the yellow tint of the throat*; it wants, moreover, the rufous tint on the back of the neck which is observable in the Common Hare. Although large, the ears are proportionately rather smaller in the Cape Hare than in the Egyptian: the weight of this latter animal, when full grown, is probably not more than half that of the Cape species; the two species, moreover, differ in their colouring.

The fur on the upper parts of the body, in *L. Capensis*, is mottled with black and brownish white (sometimes having a very faint rufous tint): the hairs on these parts are nearly white at the root, dusky in the middle, have a black point, and a broadish sub-terminal brown-white ring (or the ring is white, with a faint vinous red tint): the flanks and the limbs are of a bright rust colour; the abdomen is suffused with the same colour, but here the hairs are white below the points, and along the mesial line of the abdomen, as well as on the inner surface of the hind legs, the hairs are usually entirely white; the back of the neck is of the same grey-brown hue as the upper parts of the body, or nearly so, but wants the black pencilling; the chest is of a brownish rufous tint, by no means dark, and the throat is always of a yellowish hue, usually of a dirty fawn-yellow. The region of the eye and the sides of the muzzle are tawny, but bordering the eye is a white ring. The ears are finely freckled with black and

tawny on the fore part of the outer surface, and they have a large dusky patch at the apex, nearly an inch in vertical diameter; the point is fringed with black; the fringe of the ear is of a dirty yellow, or rufous white colour; the hinder margin is white. The feet are clothed with shortish hairs, and hence the nails of the toes are not hidden;[1] the denser fur on the soles of the feet is of a dirty brown colour. The tail is rather long: white beneath and at the point, and black above.

	British Museum. Ins.	Lines.	Leyden Museum. Ins.	Lines.
Length from tip of nose to root of tail	20	0	21	0
" from nose to ear	3	8	4	3
" *of ear*	5	4	5	6
Width of ditto	2	10		
Length of hind foot	4	11	5	6
" of tail, including the fur, about	5	0	6	0

The skull of *L. Capensis* is about equal in size to that of *L. timidus;* it has the nasal bones broad behind, and obliquely truncated at this part, where a lobe of the frontal bones separates them as usual, but this lobe is much smaller than in the *L. saxatilis*. The subjoined admeasurements, taken from a skull in the Leyden Museum, will serve to convey an idea of the proportions of the parts:—

	Inches.	Lines.
Total length of skull	3	5
Width	1	6¼
" between orbits	?	
Length of nasal bones	1	6
Width of ditto behind		9
" " in front		5¾
Distance between upper front incisors and molar teeth	1	0½
" " ditto and posterior margin of palate	1	4⅓
Antero-posterior diameter of palate		3

[1] In *L. saxatilis* the feet are more densely clothed.

under, and dark brownish rufous on the limbs; tail short and thick, of a rufous brown colour at the base, and dusky at the point.

Inhabits the Cape Colony, and extends to Port Natal.

The general proportions of this animal approximate it closely to the Common Rabbit. It is subject to some slight variations in its colouring, which is more or less intense, though always, comparatively speaking, dark; and the tail in some specimens is entirely of a rusty brown hue, though usually it is dusky or blackish at the point, and I feel satisfied it is upon a specimen in which the black is more extended than usual, that Dr. Rüppell has founded his *Lepus melanurus*, an animal which clearly retains all the essential characters of M. Geoffroy's previously described *L. crassicaudatus*.

The fur of the Thick-tailed Hare is dense and soft, mottled with black and brownish white on the back, but of a pale grey hue next the skin; the limbs are of a deep brownish rust colour, and so is the back of the neck; the abdomen rufous white, the hairs here being pale rufous in the middle, and whitish at the root as well as the point; the chin grey-white; the small hairs covering the inner surface of the ear (which is broad in proportion to its length, and rounded at the extremity) are for the most part of a pale greyish brown hue; the hairs forming the fringe on the anterior margin, which are shorter than usual, are whitish with dusky points; the hinder margin is dirty white; the apical portion of the ear externally is dusky, and the external band is formed of party-coloured black and grey-white hairs; the tail is brown-black, and rufous at the root.

	Leyden Museum.		British Museum.	
	Inches.	Lines.	Inches.	Lines.
Length from tip of nose to root of tail	17	9	14	0
From nose to ear, about	2	10	2	8
Length of ear	3	4	3	2
Width of ditto	2	5	1	11
Length of tarsus	3	2	2	10
" of tail, including the fur, about	3	0	2	6

My notes, made upon the *L. crassicaudatus* in the Paris Museum, describe the animal as having the tail entirely of a rusty brown hue, the legs of an uniform bright rusty red; the top of the muzzle rusty brown, and in other respects agreeing in colouring with the animal from which my description is taken. A specimen in the British Museum has the tail rufous brown at the base, and of a dark brown hue beyond.

The skull of the *Lepus crassicaudatus* is of the same size as that of the Common Rabbit; the nasal bones are narrower than in other Cape Hares, and are remarkable for being separated behind by a very large lobe of the frontals; this lobe, wedged in between the nasal bones, terminates at the commencement of the posterior third part of the bones just mentioned.

	Inches.	Lines.
Length of skull from the apex of the inter-maxillaries to the posterior root of the zygomatic arch	2	4
Width of ditto	1	5¼
Length of nasal bones	1	5
Width of ditto behind		7½
" " in front		5
Length between the superior incisor, and the molar teeth	1	0½
Antero-posterior diameter of palate		3¼
Length of six upper true molars taken together		5¾
Width of upper incisors		2¼
Length of lower jaw	2	3½
Height of ditto	1	2⅓
Transverse diameter of angular portion ...		10¼

North American Hares.

We shall commence our account by noticing those *American Hares which occur in the more northern latitudes, and which become white during the winter months.*

LEPUS GLACIALIS.

The Polar Hare.

Lepus glacialis.	LEACH, in ROSS's Voyage, 8vo. ed. Lond. 1819, vol. 2, App. iv p. 170 (*L. arcticus*, l. c. p. 151).
" "	SABINE, Suppl. to Parry's First Voyage, p. *clxxxviii.* (1821).
" "	RICHARDSON, Appendix to Parry's Second Voyage, p. 321 (1825); Fauna Boreali Americana, p. 221 (1829).
" "	HARLAN, Fauna Americana, p. 194 (1825).
" "	GODMAN's Natural Hist. vol. ii. p. 162 (1826).
" "	BACHM. Journal of the Acad. of Nat. Sci. of Philadelphia, vol. 7, Part 1, p. 285, Pl. 21 (1837).
" "	AUDUBON and BACHMAN, Quadrupeds of America, Vol. 1, p. 242; No. 7, Pl. 32 (Summer fur) of the Illustrations.
" *timidus.*	FABRICIUS, Fauna Grœnlandica, p. 29 (1780).
Varying Hare.	PENNANT, Arctic Zoology, i. p. 94 (1784).

Ears about equal to the head in length; hind foot large; tail short, and very bushy; incisor teeth narrow. *Summer fur*—General hue sooty-grey (not dark); the ears black, with a white fringe to the greater part of the hinder margin. *Winter fur*—Pure white (the hairs white to the root); tip of ear with a small black patch.

Inhabits the northernmost parts of North America, having been found as far north as the N. Georgian Islands, in lat. 75°; occurs on both sides of Baffin's Bay, and, on the east side of America, extends through Labrador into Newfoundland[1]. In the interior of the continent its southern limit is about 62° N. lat.[2]

There is scarcely a spot in the Arctic regions, the most desolate and sterile that can be discovered, Capt. Sir James

[1] Dr. Bachman is inclined to believe, from statements which have been made to him, that the Polar Hare extends into Nova Scotia, and the northern parts of Maine.

[2] The Polar Hare "is not found in wooded districts; hence it does not come further south on the line of the Mackenzie and Slave Lake, than lat. 64°."—*Rich.*, Faun. Bor. Am.

Ross observes, in which this animal is not to be found, and that, too, throughout the winter; nor does it seek to shelter itself from the inclemency of the weather, by burrowing in the snow, but is found generally sitting solitary under the lee of a large stone, where the snow-drift, as it passes along, seems in some measure to afford a protection from the bitterness of the blast that impels it, by collecting around, and half burying the animal beneath it; or, according to Dr. (now Sir John) Richardson, it seeks the sides of hills, where the wind prevents the snow from lodging deeply, and where, even in winter, it can procure the berries of the Alpine Arbutus, the bark of some dwarf willows, or the evergreen leaves of the Labrador tea-plant (*Ledum*[1]). "The Polar Hare," Sir John Richardson proceeds to observe, "is not a very shy animal, and on the approach of a hunter it merely runs to a little distance, repeating this manœuvre as often as its pursurer comes nearly within gun-shot, until it is thoroughly scared by his perseverance, when it makes off."

A specimen captured by Sir John Ross's party became sufficiently tame to feed out of the hand, and was allowed to run loose about the ship's cabin. Although constantly in a temperature never much below the freezing point, its fur, it is stated, assumed the white colour as early as those which were running wild. Its winter coat was cast early in May, and was not replaced by the darker hairs of the ordinary summer fur, but retained the pure white colour[2].

The Polar Hare appears to be a more bulky animal than our common European species, but this arises from the greater length and density of its fur; its size, in fact, being

[1] "On the barren coast of Winter Island, the Hares went out on the ice to the ships, to feed upon the tea-leaves thrown overboard by the sailors."—Quoted by Richardson from Lyon's Private Journal.

[2] Appendix to Ross's Second Voyage—Nat. Hist., p. xvi.

nearly the same. In its winter fur it can scarcely be distinguished from the white specimens of *L. variabilis*, having, like that animal, but a small black patch at the extremity of the ears; whilst, however, the Polar Hare is somewhat larger than the Varying Hare, its hind foot is absolutely shorter[1]. In its summer fur it is readily distinguished from the *L. variabilis* (and, indeed, from all other Hares here described), by its almost uniformly black ears.

In the British Museum are specimens, from Labrador, exhibiting the animal both in its summer and winter dress. A specimen in its summer fur most closely resembles the individual described and figured by Dr. Bachman, and which that gentleman allowed me to examine. Its general hue is grey, suffused with sooty black, but so faintly, that the prevailing tint is by no means dark: the back of the animal is rather finely pencilled with greyish white, and the hairs on this part are whitish at the root, then of a dirty yellowish hue followed by a brownish tint, a greyish white, subterminal ring, and a dusky point; on the under parts of the body the hairs are uniformly white; the orbit of the eye, and the tail, are also white. The feet are very densely clothed with fur; that on their under surface is of a dirty brownish yellow hue. The ears are densely clothed, and almost entirely black, slightly inclining to grey on the hinder part of the outer surface and on the middle part of the inner surface; and

[1] The average length of the hind foot, in four specimens, I found to be 5″ 11¾‴, the average length of the animals being 25″ 1‴; whilst in the *L. variabilis*, taking the average of six specimens, the foot was 6″ 3⅛‴, and the length of the body 22″ 3⅝‴. When, with this point of distinction, are taken into consideration other differences observable in the structure of the skull and teeth, and in the colouring of the animals in their summer fur, it must be admitted that there are ample grounds for regarding the Polar Hare of the Western Hemisphere as specifically distinct from what may be termed the Polar Hare (*L. variabilis*), of the Eastern Hemisphere; two animals which, by many naturalists, were formerly confounded.

somewhat brownish at the point; the hinder margin is fringed with white hairs, but the white hairs do not extend either to the point or to the base of the ear, being replaced by a black fringe at those parts.

With regard to the winter fur, it is only necessary to state that it is of a pure white colour on all parts, excepting on the soles of the feet and point of the ears; it is long, soft, and very dense: at the apex of the ear the black patch is small, being not more than half an inch in diameter, and composed almost entirely of the long hairs which spring from the margin of the ear.

Dr. Bachman's specimen was killed in the middle of August, at which time the change from the summer to the winter fur had begun to take place, for on the hinder part of the back was a large white patch, and some few white spots were visible on the sides of the body.

A nearly mature fœtal specimen of the Polar Hare, examined by Sir J. Richardson, was of a blackish brown colour on the upper parts of the body and outer surface of the extremities. Some specimens examined by Sir James Ross, and which were apparently less advanced in development, were of a dark grey colour.[1] A specimen, three months old (measuring 17 inches in length, and with the ears 3½ inches in length), is described by Sir J. Richardson as having the general tint of the upper parts hoary, the hairs of the fur being black at the root and white at the point; the abdomen, feet, and tail, entirely white; the ears similar in colour to the back, but with the proportion of black hairs rather greater, their margins white, and their points with a brownish black spot.

[1] Four, six, and eight young have been found *in utero*.

	Brit. Museum. Summer fur. Labrador.		Brit. Museum. Winter fur. Labrador.		Brit. Museum. Winter fur. Baffin's Bay.		Summer fur. Newfoundland.		From Bear Lake. Dr. Richardson.	
	Ins.	Lns	Ins.	Lns	Ins.	Lns	Ins.	Lns	Ins.	Lns
Length, tip of nose to root of tail	25	0	26	0	26	0	24	0	22	6
" " ditto to ear	4	2	4	3	4	3	4	1	4	6[1]
" of ear	4	0	4	3	4	0	4	0	4	6
Width of ditto	2	1								
Length of hind foot	6	0	6	0	5	9	6	0	6	6
" of tail, including the fur, about	2	6	3	0			3	0	3	6

The skull of the Polar Hare is about equal in size to that of the Common Hare, but its proportions differ considerably; the most striking difference being the greater width of the interorbital portion of the cranium in the former animal: the upper surface of the frontal bones have the anterior half rather strongly depressed, and the hinder half very convex; the cranial portion of the skull is broader, and its outline descends more suddenly from before backwards; the supra-orbital processes are very large; the zygoma is very deep, and shorter than in the Common Hare: the sudden contraction of the fore half of the incisive opening, and the structure of the upper incisor teeth, furnish well-marked distinguishing characters, when the skull of the Polar Hare is compared with that of the *L. timidus*, or of the *L. variabilis*. In both these last-named species the principal upper incisor has the transverse diameter greater than the longitudinal, whilst in the Polar Hare, these teeth (which are remarkable for their narrowness) have the antero-posterior diameter equal

[1] This last dimension was taken to the back of the head; the skull of the same specimen measured (according to Dr. Richardson) 3 inches and 10 lines in length.

to the transverse one: the anterior surface is convex; the groove is less deep than usual, and two or three small longitudinal striæ may be observed in this groove. The lower incisors, like those of the upper jaw, are very narrow, being rather narrower than the corresponding teeth in a skull of *L. variabilis* before me, although that skull is considerably smaller than the skull of the Polar Hare; their front surface is somewhat concave.

	Melville Island. Leyden Museum.		Greenland. Leyden. Museum.		Greenland. British Museum.		Greenland. British Museum.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Total length of skull	4	3½		?	3	10½	3	6¼
Width of ditto	2	1	2	0¾	1	11	1	10½
Length of nasal bones	1	9	1	7½	1	8	1	4½
Width of ditto behind		11¼		11		10½		9½
" " in front		9½		9		8¾		7¾
" between orbits	1	7	1	7½	1	5⅓	1	4
From upper incisor to molar teeth	1	5	1	4¼	1	3⅓	1	1½
From front of upper incisor to hinder margin of palate ...	1	9⅓	1	8½	1	7½	1	5⅔
Antero-posterior diameter of palate		3⅓		3¾		3½		3¼
Length of the six upper true molars, taken together		9		9		8¾		8
Width of the two front upper incisors		2¾		2¾		2⅔		2½
Length of lower jaw	3	2½	3	2	2	11	2	7
Height of ditto	1	10½	1	8½	1	10	1	8½
Transverse diameter of angular portion	1	2¼	1	2	1	1½	1	0½

The skull, the dimensions of which are given in the third column, presents all the same general characters which I observed in the other three skulls—having the same strongly-convex swelling of the frontal bones, the broad interorbital space, deep and short zygoma, contracted incisive opening,

and narrow incisors, convex in front; but it is remarkable for the shortness of the facial portion, a part of the skull which is more subject to variation in the Hares than other parts.

LEPUS AMERICANUS.

American Hare.

Lepus Americanus. ERXLEBEN, Systema Regni Animalis, p. 330 (1777).
" *Hudsonius*. PALLAS, Nov. Spe. Glir. p. 30 (1778).
" *Americanus*. RICHARDS., Appendix to Parry's Second Voy., p. 324, (1825).—Fauna Borealis Americana, p. 217 (1829).
" " BACHM., Journ. of the Acad. of Nat. Sci. of Philad. vii. p. 403 (1837); vol. viii. p. 76.
" " AUDUB. and BACHM., Quadr. of N. America, i. p. 93. Illustr. No. 3, Plates 11 and 12.
" *Virginianus* (The Northern Hare). BACHM., l. c. vii. p. 301.
" " HARLAN., Fauna Americana, p. 196 (1825).

Ears nearly equal to the head in length; well clothed with longish hairs; tarsus long, and densely clothed with fur; tail very short. Colour, *in winter*, white, but with the hairs on the upper parts of the body grey at the root, of a palish yellow-brown in the middle, and with the exposed parts, only, white. *Summer fur* with the general hue reddish brown; pencilled with black on the upper parts of the body; throat, abdomen, and under surface of the tail, white.

Inhabits the northern parts of North America, but does not extend into such high latitudes as the *Lepus glacialis*[1]; according to Dr. Richardson, it ranges northward as high as lat. 64° 30′; and Dr. Bachman gives its southern limit at about lat. 51°; it is the Common Hare about Hudson's Bay, is found in Canada, Newfoundland, all the New England States, and in the northern portions of New York, Pennsylvania, and Ohio. It is apparently confined to the eastern portions of the continent.

Dr. Bachman informs us that the present species is the

[1] The mean range of the *Lep. glacialis* is about lat. 61°, and that of *L. Americanus* about eight or nine degrees more south.

most fleet and active of the American Hares, and that excellent observer confirms the statement made by Lewis and Clarke, of its possessing the power of leaping the enormous distance of twenty-one feet at a bound. It is almost hopeless to hunt this animal, for when chased, it winds and doubles through the entangled paths of hemlock and spruce, until it fairly wears out its pursuers; and unless the hunter should appear to stop its course with the gun, it is certain to escape. In the northern portions of the United States it avoids the open grounds, confining itself to the forests, and more particularly preferring dry and elevated grounds, covered with Pines and Firs.

Never having had an opportunity of examining the Northern Hare in its full summer fur, the following is extracted from Dr. Bachman's description:—"In summer, the whole of the upper surface of the animal is reddish brown, formed by hairs which are at their roots, and for two-thirds of their length, of a bluish ash colour, then reddish yellow, succeeded by a narrow line of dark brown, the part next the tips, or points, reddish brown, but nearly all the hairs tipped with black—this colour predominating towards the rump. Whiskers mostly black; a few of the hairs white, the longest reaching beyond the head: ears brown, with a narrow black border on the outer margin, and a slight fringe of white hairs on the inner. In some specimens there is a fawn, and in others a light coloured edge, around the eye, and a few white hairs on the forehead. The iris of the eye is light silvery yellow. The point of the nose, chin, and throat, white; neck yellowish brown. Inner surface of legs, and under surface of the body, white. The tail brown above, and white below. The summer fur is assumed in April, and remains without much change till about the beginning of November, in the latitude of Quebec, and till the middle of the same month in the State of New York, and western parts of Pennsylvania; after which

season the animal gains its winter pelage. During the winter, in high northern latitudes, it becomes nearly pure white, with the exception of the black edge on the outer borders of the ears. In the latitude of Albany, New York, it has always a tinge of reddish brown."

In the collection of the Zoological Society, and in the British Museum, are several specimens of the Northern Hare having the winter fur, which, though white externally, differs from the winter fur of the Polar Hare in always being of a pale grey next the skin on the upper parts of the body, and each hair on these parts is moreover of a yellow-brown hue in the middle. The hairs on the fore part of the ears are likewise party-coloured, being yellowish or dusky at the roots; towards the point, externally, they are blackish at the root, and have white points; at the edge sometimes wanting the white point, they form a black fringe, but very commonly even here the black is more or less hidden by the points being white.

The National Collection also contains a specimen of the *L. Americanus*, which is interesting as having been procured in the month of November, a time in which the fur is undergoing its change from summer to winter colouring. This animal is white, with the exception of the upper surface of the head, the cheek, back, and chest; here the party-coloured, rufous-yellow, and black hairs of the summer dress, remain. On the back, the coloured hairs are considerably longer than on the sides of the body, where they are white, and it is evident that a considerable portion of the summer hairs have been shed from the back, since those remaining are somewhat scanty, and, upon separating them, we find an abundance of white hairs, which are evidently new, and had not attained their full length at the time that the animal was killed. Were the long and somewhat scanty coloured hairs to be plucked from this animal, it would present the same condition as

other specimens which have attained their full winter pelage; with these exceptions, that its back would not be of so pure a white, for the yellowish colour, which at all times is seen in the middle portion of each hair, would be but partially hidden, the white points of the hairs being less elongated; and the fur, generally, would be shorter. On the whole, I feel convinced from the examination of this specimen, that the white of the winter pelage is not always (as good observers state it to be in our *Lepus variabilis*), due to a change of colour only, but, in some cases (as in the case before us), is accompanied by a shedding of the summer fur—or rather by a partial shedding of the fur; for, judging from the conditions presented by different specimens of the Northern Hare, now before me, I am strongly inclined to believe that the longer and coarser hairs of the fur only, are shed and replaced by equally long, but white-pointed hairs, and that the dense under fur undergoes a change of colour, and becomes longer.

	British Museum.		From fresh specimens. Dr. Bachman.			
	Ins.	Lines.	Ins.	Lines	Ins.	Lines.
Length from tip of nose to root of tail ...	19	6	19	3	16	0
" from nose to ear	3	7				
" of ear	3	4	3	6	3	6
Width of ditto, about	2	0				
Length of tail (vertebræ)			1	3	1	6
" of ditto, with the fur	2	9	2	3	2	6
" of hind foot to end of nails ...	5	6	5	6	5	3

The average weight of full grown specimens, according to Dr. Bachman, is about 5½ lbs.

Hares confined, for the most part, to the middle and southern portions of North America:—

LEPUS AQUATICUS.

Swamp Hare.

Lepus aquaticus. BACHM. Journal of the Acad. of Natural Sciences of Philadelphia, vol. vii. p. 319, Plate 22, No. II.—(Read March, 1837).
" " AUDUBON and BACHMAN, Quadrupeds of North America, vol. i. p. 287 (1847); Illustr. No. VIII. Plate 37.
" *Douglasii*, var. 1. GRAY, Magaz. of Nat. Hist. for Nov. 1837; vol. i. p. 586.

Ears but little shorter than the head; tail and tarsus moderate as to length: fur coarse, glossy, and somewhat closely applied to the body; on the upper parts of the animal of a brownish yellow colour, much mottled with black (chiefly black in the winter); behind the ear, rufous; chin and abdomen, white; ears edged with black externally at the apex; tail yellow-brown above, white beneath; legs and feet suffused with rusty red.

This species is common in the western part of the State of Alabama; still more abundant in the State of Mississippi, and in the lower part of Louisiana, and extends into Texas.

The Swamp Hare greatly resembles the two species next to be described (the *L. palustris* and *L. sylvaticus*), but may be distinguished by its much larger size,[1] by its ears, tarsi, and tail being proportionately longer, and its fur coarser and more closely applied to the body.

Although the present species is occasionally seen on high grounds in the dense forest, it prefers (as we are informed by Dr. Bachman) low and marshy situations, or the neighbourhood of streams and ponds of water. It swims with great

[1] "The Swamp Hare is a third larger than the Marsh Hare; the largest specimen of the latter, in more than fifty that we measured, was only 14 inches long, whilst the largest Swamp Hare was 22 inches; and we are informed that it is often much larger."—AUD. and BACHM.

facility, and will sometimes dive, when danger threatens, to the distance of eight or ten feet. When chased by dogs the Swamp Hare runs with great swiftness, and is able to escape from them without difficulty; but it almost invariably directs its flight to the water, where it commonly swims to some spot where hollows are made in the banks by the water, or where some overhanging roots of trees afford a shelter.[1] It subsists on the roots of various kinds of aquatic plants, especially on a species of iris growing in the water.

The young of this Hare are frequently found in nests formed of leaves and grasses, placed on hillocks in the swamps, or in the hollow of some fallen tree. The female is said to produce from four to six young, and to have at least two broods in a season.

The following dimensions (from the work of Messrs. Audubon and Bachman) were taken by Dr. Lee, from a specimen of the Marsh Hare, in the flesh :—

	Inches.	Lines.
Length from the point of the nose to the insertion of the tail	20	0
" of head	4	3
" *of ears posteriorly*	3	10½
Height to shoulder	11	0
Length of hind foot	4	6
" of the tail vertebræ	2	1½
" *tail, including the fur*	3	0

The weight of a female specimen, in bad *condition*, was *found to be six pounds.*

Lepus Douglasii. Var. 1, Gray.

Ears rather shorter than the head ; tail and tarsus moderate as to length; the nails stout and large: fur rather harsh, its general hue of a rich brownish yellow; on the upper parts

[1] Messrs. Audubon and Bachman refer to a specimen of the Swamp Hare (presented by them to the Academy of Natural Sciences of Philadelphia), which, upon being pursued, swam across the Alabama River.

of the body strongly pencilled with black; on the sides of the body with but little black pencilling, and on the lower parts of the flanks, as well as on the shoulders, the colour is uniform, and the chest likewise is of an uniform yellowish colour, or very nearly so; throat and abdomen rufous yellow, inclining to white: ears moderately well clothed with yellow hairs internally, which become richer in tint, and almost rufous at the point of those organs; the band indistinctly grizzled with dusky; externally the ear-band is more distinctly grizzled with dusky and yellowish, and the remaining portion, like the back of the neck, is of a bright rusty yellow, excepting at the apex, where there is a smallish, but distinct, black patch; and, moreover, there is a black line running down the hinder margin, extending from the tip of the ear about half way towards the base; the extreme edge of the ear (in front, behind, and at the apex) is rufous yellow: the limbs are of a somewhat darker hue than the sides of the body, being suffused with rust colour: the tail is pencilled with dusky, and rufous-yellow above, and with white and dirty yellow below. The hairs of the back are of a very pale grey at the root, then pale brownish yellow, followed by black, a sub-terminal broad, rich brown yellow ring, and a black point; on the abdomen the hairs are white, with a very indistinct trace of grey next the skin.

From Texas (?): in the British Museum.

Dr. Bachman, who examined this animal when in England, recognised in it a specimen of his *Lep. aquaticus;* nevertheless (although I do not doubt this view is correct), I have thought it desirable to introduce the above description of its character, since by so doing I am enabled to notice several points in addition to those given in the description gleaned from Dr. Bachman's account of *L. aquaticus*, some of which will probably furnish constant distinguishing characters of this species when compared with the two very nearly allied animals, the *L. sylvaticus* and *L. palustris*. For instance, the uniform rufous-yellow hue of the hinder half of the ear

externally, combined with the distinct black spot at the apex, and the black line next the hinder margin, as well as the hairs of the abdomen being white at the root, are characters in which the animal before me differs from either the Wood Hare or the Marsh Hare, both these last mentioned species having the fur of the abdomen of a distinct grey hue below the exposed ends of the hairs—which, by the by, is a rare circumstance in the Hares: in the latter (*L. palustris*) there is no black edging to the ear, and in the *L. sylvaticus* the black edging at the point of the ear is narrow, and I always find a black line running along the anterior margin, instead of along the posterior one, as in *L. aquaticus*. On the other hand, the greater harshness of the fur, and the tail being pure white beneath—characters which are noticed as distinguishing the *L. aquaticus* from *L. palustris*—do not in the specimens in the British Museum present points of distinction, the tail being coloured beneath, and the fur being somewhat less harsh in the *L. aquaticus* than in the *L. palustris*. This probably arises from our specimen being immature. Differences of proportion in the three above-mentioned animals will be perceived upon comparing the following dimensions:—

	L. Douglasii. Var. 1. GRAY. *L. aquaticus.* BACHM.		*L. palustris.* Brit. Museum.		*L. sylvaticus.* Brit. Museum.	
	Ins.	Lns.	Ins.	Lns.	Ins.	Lns.
Length from tip of nose to root of tail ...	17	0	17	0	16	6
" from tip of nose to ear	3	7	3	4	3	3
" of ear	3	3	2	6	2	10
Width of ditto	2	3	1	10	1	9
Length of hind foot and nails	4	0	3	5	3	7
" of tail, including the fur	3	0	1	10	?	

LEPUS SYLVATICUS.

The Wood Hare.

Lepus sylvaticus. BACHM. Journal of the Acad. of Nat. Sci. of Philadelphia, vol. vii. p. 403; (*L. Americanus*), l. c. p. 326.

" " AUDUB. et BACHM. Quadrup. of North Amer. p. 173; Illustr. No. 5, Pl. 22.

" *Americanus.* DESMAREST, Mammalogie, Part II. p. 351.[1]

" *nanus.* DE KAY, Nat. Hist. of New York.

" " SCHREB. (?), Säugth. vol. iv. p. 881, Pl. 234, B.

Grey Rabbit of the Americans.

Ears rather shorter than the head; limbs and tail short; feet clothed with shortish hairs, which do not hide the nails: fur somewhat harsh to the touch; on the upper parts of the body mottled with black and pale brownish rufous; on the top of the head suffused with reddish chesnut; on the back of the neck of a bright rust colour; sides of body greyish; throat and abdomen, white; legs suffused with rusty red, the tarsi whitish above: ears, with the apical portion, clothed with pale hairs internally, margined with brown-black at the apex externally, and with a blackish line along the anterior margin; tail brown above, white beneath.

Found almost throughout the United States. According to Dr. Bachman's observations, the *L. sylvaticus* does not extend in the north direction beyond the southern counties of New Hampshire: it abounds in the sandy districts, covered with pine-trees, west of the city of Albany, and from thence it is traced southwards to the northern parts of Florida, occurring in the intermediate States of Pennsylvania, New Jersey,

[1] From my notes I find that the present species is the *Lepus Americanus* of the Paris and Leyden Museums; in the former the name *Lepus nanus* of Schreber is attached to the animal as a synonym. Schreber's description, under the name just mentioned, certainly, as it appears to me, for the most part applies to the *Lepus sylvaticus*, but is rendered inaccurate by his having introduced into his account statements made by other authors which refer to the Northern Hare.

Maryland, Virginia, and North and South Carolina. It is a native likewise of the southern States west of Florida, and very abundant on the upper Missouri River to nearly 1000 miles above Saint Louis.[1]

The three species of Hare, first clearly described and distinguished by Dr. Bachman under the specific names *aquaticus*, *sylvaticus*, and *palustris*, so closely resemble each other, that it is somewhat difficult to convey, in words, the points of distinction. They all agree in having the feet clothed with comparatively short and stiff hairs; their ears and limbs are shorter than in many of the species of *Lepus*, and their fur is by no means soft, as compared with that of the Common Hare or Rabbit. The *L. sylvaticus* is intermediate in size between the *L. aquaticus* and the *L. palustris*, and with regard to the proportions of the ears and hind feet, it also holds a middle station. The reddish chestnut hue of the upper surface of the head, a bright rusty-red colour on the back of the neck, and extending to the shoulders, the sides of the body (and especially the haunches), being greyish, the tarsi inclining to white on the upper surface, the ears edged with black, or brown-black, externally, both on the fore and apical margins, are points in the colouring which, combined, will serve to distinguish the Wood Hare. To these points it is only necessary to add, that the orbits of the eyes are whitish; the ears are clothed with dirty white hairs externally, or with yellow hairs (generally of a distinct yellow cast at the apex of the ear), and present but an indistinct trace of an inner band of party-coloured hairs. The hairs of the back are of a pale grey hue at the root, from which part, proceeding towards the point, they are gradually shaded into black, have a broad, subterminal, pale brownish, rufous ring: on the abdomen, about two-thirds of each hair

[1] See Audubon and Bachman's Quad. of North America, i. p. 179.

is white, and the remaining, basal, portion is grey. The tail is white beneath, and brown above, but many of the hairs on this part have a yellow point. The fore legs are of a bright rufous colour; the feet somewhat paler; those of the hind foot almost white on the upper surface, and dirty brown on the under; the back of the hind legs is of a rusty red hue.

	Zoological Society.		Zoological Society.		Leyden Mus.		From Dr. Bachman.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length from tip of nose to root of tail	18	0	16	0	16	9	15	0
" from ditto to ear ...	3	2	3	0	3	3	3	5
" of ear	3	0	2	11	2	8	3	0
Width of ditto	1	7	1	7	1	6		
Length of hind foot and nails ...	3	11	3	8	3	7	3	7
" of tail, including the fur, about	2	6	2	6	3	0	2	2
" of vertebræ of ditto ...							1	2

Weight of adult male, according to Dr. Bachman, 2 lbs 7 oz.

The above description is drawn up from specimens presented to the Zoological Society by Dr. Bachman; according to whom, the *Lepus sylvaticus* frequents woods, and even the densest thickets; is fond of spots which are overgrown with young pines, thickly crowded together, or thickets of the high bush-blackberry (*Rubus villosus*). If alarmed, it runs with great swiftness, but usually for a short distance only, to take refuge in some hollow tree, or amongst the entangled roots. When hunted by dogs, it sometimes makes its escape by winding and doubling in thickets which are too dense to be penetrated by a larger animal. In the northern and middle states, the burrows of the Maryland Marmot afford a safe retreat in times of danger, unless, as sometimes happens, a skunk has already taken possession of the burrow. Like

others of its genus, the Wood Hare has the habit of stamping with its hind feet, when alarmed at night, and also when engaged in combat with another of its own species. It has many enemies, falling a prey to the Weasels, Wild Cats, Foxes, and Snakes, but is, nevertheless, an abundant animal in most parts of the United States, being very prolific. Unlike the Northern Hare, the present animal never becomes white in the winter: sometimes the extreme points of the hairs become bleached in the winter months, but this, it appears, is by no means constantly the case.

LEPUS PALUSTRIS.

The Marsh Hare.

Lepus palustris. Bachm., Journal of the Acad. of Nat. Sc. of Philadelphia, vol. 7, p. 194 (May 1836), and p. 336.
" " Audubon and Bachm., Quadrupeds of North America, vol. 1, p. 151. Illustr. No. 4, Pl. 18.
" *Douglasii,* var. 2. Gray, Magazine of Nat. Hist. for Nov. 1837, vol. 1 (New Series), p. 586.

Limbs short ; ears shorter than the head: fur harsh, on the upper parts of the body mottled with black and rich brownish yellow, on the throat and under parts white ; fore legs and tarsi deep brown-rufous ; orbit of eye yellowish ; back of neck of a dirty rufous tint; ears with yellow hairs on the inner surface, and without any distinct black edging externally; tail very short, rufous-brown above, dirty yellowish beneath.

Inhabits the southern and western parts of the United States, and extends into Texas ; is found in the southern parts of North Carolina, more abundantly in South Carolina ; abundant in Georgia, Alabama, and Louisiana, and ranges to the southern point of Florida.

The habits of the Marsh Hare, as detailed by Dr. Bachman, are very similar to those of the *Lepus aquaticus*, nearly con-

fining itself to marshy situations, and taking freely to the water. It is an excellent swimmer, but, as would be supposed from the shortness of its limbs, its powers of running and leaping are far inferior to most other Hares.

The nest of the Marsh Hare has usually an arched roof, and is not unfrequently formed of a large species of rush (*Juncus effusus*), which the animal cuts into pieces of about a foot in length. These nests are often partially surrounded by water. The number of young found in the nests varies from five to seven, and the animal is said to have several litters in a season, the first of which is fully a month later than that of the Wood Hare (*L. sylvaticus*). *Lepus palustris* may be distinguished from the *L. sylvaticus* by its ears, feet, and tail, being proportionately shorter, and in the specimens which have come under my notice (among which are some presented by Dr. Bachman to the Zoological Society), I have observed certain differences in the colouring, which are perhaps constant. For instance, they want the black edging to the anterior and apical margins of the ear, which is present in all the specimens of *L. sylvaticus* I have seen; the back of the neck is of a dirty rufous tint, and this colour does n t extend backwards on to the shoulders, whilst in the Wood Hare, the back of the neck, and upper part of the shoulders, are of a bright rust colour. Another difference is somewhat striking, when the two animals are laid side by side; and that is, that the flanks and haunches want the grey hue which distinguishes *L. sylvaticus*, being of nearly the same colours as the back. The fur in the present species, moreover, is coarser, and this is more strikingly the case with respect to the fur of the abdomen. The fur on the upper parts of the body is of a deep grey colour next the skin, and each hair has a black point, and a broad ring of rich yellow-brown below the point; on the throat and abdomen the hairs are also of a dark grey at the root, but their exposed ends are

white: the chest is of a somewhat paler hue than the sides of the body, and is sometimes whitish in the mesial line; the fore legs and feet, as well as the tarsi, and the hinder part of the tibiæ, are of a deep brown-rufous tint; the orbit of the eye is a buff yellow colour[1]. The ears are clothed for the most part with yellowish hairs internally; and towards, and at the point, the hairs assume a decided yellow colour; externally they are rather sparingly clothed behind with dirty yellowish hairs, or, towards the hinder margin, with white hairs, and at the root of the ear they assume a rufous tint; the band on the fore part of the ear is composed of party-coloured dusky and yellow hairs. The tail is of a rufous-brown hue above (where, however, the hairs are dusky grey at the root), and of a dirty yellow colour beneath—sometimes white along the middle line. Of this species I have examined five specimens, three of which are in the Museum of the Zoological Society,—two being presented to that Society by Dr. Bach-

	Museum Zoological Society. Specimen from Mr. Douglas.		Museum Zoological Society. Specimen from Dr. Bachman.		Dimension from a fresh specimen. Dr. Bachman.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length from tip of nose to root of tail ...	16	0	16	0	13	0
" from ditto to ear	3	5	3	4		
" of ear	2	7	2	6	2	6
Width of ditto	1	9	1	10		
Length of hind foot and nails	3	6	3	5	3	0
" of tail, including the fur			1	6	1	6
" of tail, without the fur					1	0
From shoulder to extremity of fore foot					7	0

[1] In three specimens before me, such is the case; whilst in three specimens of *L. sylvaticus* the orbit is white.

man, and the third formed part of a collection obtained from Mr. David Douglas, and supposed to be from California[1], and two in the British Museum collection ; these latter were described by Mr. Gray under the name *L. Douglasii.*

Hares of the Western and South-western portions of North America.

Of these, the first three species described are of very small size, and have short ears; the others are of moderate, or large size, and most of them have remarkably long ears.

LEPUS NUTTALLII.

Nuttall's Hare.

Lepus Nuttallii. BACHM., Journ. of the Acad. of Nat. Sci. of Philad. vii. p. 345, Pl. 22, No. 1.
" " AUDUBON and BACHMAN'S Quadrupeds of N. America, Illust. No. 19, Pl. 94.

Ears broad, but very short—much shorter than the head: tail also very short: fur soft ; on the upper parts of the body pencilled with buff-yellow, and black ; under parts pale yellowish grey; legs and feet of a rufous-yellow colour, and a large patch on the back of the neck, which extends on to the shoulders, is of the same colour: tail white beneath.

Inhabits the west side of the Rocky Mountains in the neighbourhood of the Columbia and Shoshonee Rivers.

From all the known Hares the present species may be distinguished by its diminutive size, its bulk being nearly equal to that of the Common Norway Rat. From the *Lepus Bachmani*, which approaches it most nearly in size, Nut-

[1] As there may be some doubt on this point, I have not introduced California as amongst the parts of North America inhabited by this species.

tall's Hare differs in having much shorter ears, and in having a very large rufous patch covering the back of the neck, and extending on to the shoulders, and likewise in having the limbs rufous. The ears are described by Dr. Bachman as broad and rounded; the feet thickly clothed with soft hair, which completely hides the nails, and the tail concealed (in the dried skin) by the long fur of the hinder part of the body. The fur soft; on the upper parts of the body, presenting a mixture of buff and dark brown, and on the under parts, of a light buff-grey colour. The fur on the back is of a lead-grey colour for three-fourths of its length from the roots, then light ash, mixed with buff; and the long interspersed hairs are tipped with black. The ears are tolerably well clothed, both externally and internally, with ash-coloured hairs, have a black line on the fore part, and are edged with white. A large buff-coloured patch extends from behind the ears to the back, and the limbs are of the same colour, but with a mixture of rufous, which is extended upwards to the shoulders, and on to the thighs. The soles of the feet are yellowish brown, and the tail is white on the under surface.

	Inches.	Lines.
Length from tip of nose to root of tail ...	6	9
" of head	2	1½
" of ear	1	6
" of hind foot	2	0
" of tail (vertebræ)		9
" of ditto, including the fur	1	3

This little Hare was discovered by Mr. Nuttall, whose researches in the botany of the Rocky Mountains are well known, and, according to that gentleman's note which accompanied a specimen presented to Dr. Bachman, it was met with west of the Rocky Mountains, where it inhabits thickets by the banks of several of the small streams which flow into the Shoshonee and Columbia Rivers.

LEPUS BACHMANI.

Bachman's Hare.

Lepus Bachmani. WATERH., Proceedings of the Zoological Society for August, 1838, p. 103.

Ears rather longer than the head; tarsi short, and well clothed with fur; fur moderately soft, its general hue brown (on the back pencilled with black and pale brown); sides of body grey-brown; abdomen white, slightly suffused with rufous; occiput brown: ears with a narrow indistinct dusky edging at the apex externally.

Inhabits the south-west portions of North America — perhaps California.

The specimen upon which the *Lepus Bachmani* was founded is *possibly* not full grown, but the condition of the incisor teeth forbid our supposing it very young, since they are well developed, and of equal width throughout, and, in fact, the only ground for suspecting the animal may not be adult, is its small size. It has the short feet which characterize the *L. palustris*, and as the last mentioned animal was received by the Zoological Society in the same collection as the *Lepus Bachmani*, I have more than once compared the two animals very carefully together. Notwithstanding that the Hare, which I have named after my friend Dr. Bachman, is not above one-third of the size of the *L. palustris*, its ears are absolutely longer; and another important difference is observable in the feet, which, instead of being clothed with short and adpressed hairs, which do not conceal the nails, are, in Bachman's Hare, clothed with long and woolly hairs— those from the toes projecting about a quarter of an inch beyond the points of the nails. The fur in the present species is much softer than in *L. palustris*, and differs in its

colouring; the incisor teeth are strongly grooved, and the division of the tooth which is on the outer side of the groove is less broad than in the Marsh Hare. The general brown hue of the back is produced by a mixture of black and pale yellow brown, the visible portions of the hairs being of this colour, but each hair has its lower half of a deep grey colour, and the hairs are almost black immediately below the sub-terminal pale ring: the hairs on the abdomen are of a distinct grey colour at the root, and white beyond, but slightly suffused with rufous at the point; and, towards the sides of the body, the rufous tint is much more conspicuous. The legs and feet (if we except the upper surface of the tarsus, which is very pale) are very nearly of the same brown tint as the sides of the body, these parts wanting the red tint which is seen in the *L. palustris*, *L. aquaticus*, and *L. sylvaticus*, which, like the present species, have short feet. The ears are clothed with grey-white hairs internally, but near the hinder margin they are grizzled with black, and at the apical margin there is a very narrow band of brownish yellow hairs; on the front edge of the ear is a small white fringe; externally, the band of the ear is grizzled with black and yellow; there is a narrow dusky edging at the apex, and the hinder half is grey-white, excepting at the root of the ear, where a rufous tint is visible. The back of the neck is brown, but towards the shoulders slightly tinted with rufous. The tail is white below, and dusky above, with pencillings of dirty yellow.

	Inches.	Lines.
Length from tip of nose to root of tail ...	11	0
" from ditto to ear	2	5½
" of ear	2	8
Width of ditto	1	8
" of the hind foot	2	10
" of tail, including the fur, about ...	1	3

LEPUS ARTEMISIÆ.

Wormwood Hare.

Lepus artemisiæ.	Bachm., Journ. of the Acad. of Nat. Sci. of Philad. vol. viii. p. 94.
" "	Audub. and Bachm., Quadr. of N. America, Illustr. No. 18, Pl. 88.
" *artemisiacus.*	Wagner, Schreb. Säugth. Suppl. iv. p. 115.

Ears about equal to the head in length; tarsi tolerably long, and well clothed; tail short: fur soft; on the upper parts of the animal pencilled with black and brownish white; on the under parts, white; back of the neck, and limbs, for the most part, of a pale rusty-fawn colour: ears margined with black at the apex externally: tail above, coloured like the back; beneath, white.

Inhabits the Rocky Mountains.

The Wormwood Hare is a very small species (much smaller than the Common Rabbit), being about equal in size to the *Lep. Bachmani*, from which it differs in having a longer tarsus, as well as in its colouring.

The following description was taken from a specimen brought to England by Dr. Bachman, which that gentleman kindly allowed me to examine.

The fur is soft, and the general hue is somewhat pale; the hairs on the back are of a pale grey at the root, shaded into brown in the middle, annulated with brown-white towards the point, and black at the point; on the abdomen the hairs are also pale grey at the root, but they are white externally, as are also the hairs on the throat: the inner surface of the limbs are white; on the sides of the neck, and on the chest, the hairs are grey, tipped with brown-white, but with a faint yellow hue; the whole of the back of the neck—commencing

immediately behind the ears, and extending to the back—is of a pale rusty fawn colour; and the legs, externally, are of the same hue; the feet are of a dirty yellow-brown hue beneath, and the tarsus is very pale along the middle part of the upper surface. The tail is coloured like the back of the animal on its upper surface, but assumes a grey-black tint towards the tip; beneath, it is white. The bands of the ears are finely freckled with dusky and dirty white; the hinder surface, externally, is dirty white, as well as the inner surface; the margins are whitish, but on the outer surface are edged with black at the apex. The upper incisors are deeply grooved.

	Inches.	Lines.
Length from tip of nose to root of tail ...	12	0
" from ditto to ear	2	7
" of ear	2	8
" of tarsus	3	2

LEPUS CAMPESTRIS.

Prairie Hare.

Lepus campestris. BACHM., Jour. of the Acad. of Nat. Sci. of Philad. vol. vii. p. 349 (1837).
" *Townsendii.* BACHM., l. c. vol. viii. Pt. 1, p. 92, Pl. 2 (1839).
" " AUDUB. and BACHM., Quadr. of N. America, vol. i. p. 25 (1847), No. 1, Pl. 3 of the Illustrations.
" *Virginianus.* RICHARDS., Faun. Bor. Amer. Pt. 1, p. 224 (1829).
Prairie Hare of the Fur Traders.

Ears longer than the head; tarsi long, and densely clothed with fur: fur very soft, the prevailing hue pale ashy grey, obscurely tinted with yellow; throat and under parts of the body, and the tail, white, the latter with a few dark hairs on the upper surface; back of neck dirty white; ears with a large black patch at the apex externally.

Found on both sides of the Rocky Mountains in the region of the Columbia River, and ranges eastwards, on the Missouri, beyond the Yellowstone River[1]—range of *L. Townsendii* of Bachman. The *L. Virginianus* of Richardson, according to that author, inhabits the plains through which the north and south branches of the Saskatchewan flow, and which extend westward as far as the Winnipegoos Lake, and the southern extremity of Lake Winnipeg; it is not known to range further north than the 55th parallel.

With regard to the names associated at the head of this account, it is necessary to state that Dr. Bachman gave the name *Lepus campestris* to the animal described by Dr. Richardson under the name *L. Virginianus*, because this latter name had been previously applied by Dr. Harlan to a distinct species of Hare. The *Lepus Townsendii* was founded by Dr. Bachman upon specimens of a Hare which he was induced to believe would prove distinct from the *L. campestris*, from his having received information that it did not become white in the winter months, like that animal; more recently, however, Dr. Bachman has been assured by residents in Missouri, that the *L. Townsendii* is subject to the same change of colour. As, on the other hand, the animals described under the names *campestris* and *Town-*

[1] The accounts before us, from which we have to ascertain the geographical range of this animal, are extremely vague; one of them gives "more than 1200 miles east of the Rocky Mountains," as a locality for the species! From the context, however, there can be no doubt that the traveller from whose notes the quotation is made, was on the Missouri (though it is not so stated in plain terms), and it seems probable that the 1200 miles mentioned may include the windings of that river. Mr. Nuttall, as quoted by Dr. Bachman, states that our Hare, though seen frequently on the plains of the Platte, is still more common to the west of the Rocky Mountains.

The habitats of the *L. Virginianus* of Richardson are kept distinct, since it is just possible that the animal may prove a different species to the *L. Towsendii*.

sendii agree, according to the descriptions, in the colouring of the summer fur, and in size, and are both inhabitants of the western prairies, there are no grounds for regarding them as distinct.

A specimen of the Prairie Hare, which Dr. Bachman allowed me to examine, and which is probably one of the specimens referred to in the "Quadrupeds of North America," was very nearly equal in size to the Common European Hare, and likewise agreed very closely with that animal in the proportions of its limbs, but its ears were distinctly longer, and its colouring differed from that of most Hares in being, on the upper parts of the body, of a palish ashy grey hue, in which a faint yellow tinge was perceptible; the hairs on the back were grey-white at the root, brown-grey beyond, almost black below the cream-coloured sub-terminal ring, and black at the point; the fur on the abdomen white to the skin; throat and inner side of the limbs also white; the tail white, having, however, a greyish hue at the base, on the upper surface, owing to there being an admixture of black hairs at that point: the tarsi white above, and of a pale brownish colour beneath; the sides of the muzzle suffused with cream-colour; the orbit of the eye white; back of the neck nearly white, especially near the root of the ear: the coloured bands of the ears composed of small hairs, partly blackish and partly cream-coloured; the hairs forming the fringe on the anterior margin, very long, and of a cream yellow, the hinder margin edged with white; the hinder half of the outer surface of the ear pure white, excepting at the point, where the hairs were black, and formed a moderate sized patch. The fur was dense, and very soft, and the feet were densely clothed, though rather less so than in the Polar Hare.

			Adult Male, From Upper Missouri. Dr. Bachman.		Adult Female. Dr. Bachman.		Young. Dr. Bachman.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines
Length from tip of nose to root of tail	21	0	21	6	21	0	12	0
" of head			4	7			2	9
" of ear	5	2	5	6	5	3	2	7½
" of hind foot ...	5	6	5	7½			3	7½
" of tail, including the fur ...	5	0	4	9	4	6	2	1½
" of ditto, without the fur ..			3	1½	3	0	1	3
From shoulder to the extremity of the fore foot					13	6	7	1½
Weight			6½ lbs.					

The above description agrees so closely with that of *Lepus Townsendii* of Dr. Bachman, that I have only thought it necessary to add the dimensions of the specimens examined by that naturalist, whose correspondents inform him that the species exclusively inhabits the plains, and more especially those which are overgrown with the aromatic Wormwood (*Artemisia*). It is very abundant in the neighbourhood of Fort Walla-Walla, but is said to disappear, together with the wormwood bushes, in proceeding westwards towards the sea.

Lepus Virginianus. RICHARDSON.

This animal, which is said to be common on the plains through which the north and south branches of the Saskatchewan flow, is described as being entirely white, with the exception of the ears, which have a brownish black tip, the black about as much extended as in the Polar Hare, and has the fore part of the outer surface, and the hinder part of the inner

surface, of a fawn colour. Although white externally, the hairs of the fur are found to be coloured below the exposed parts: on the back they are white for one-third of their length from the root, and pale brownish yellow in the middle; on the cheeks the hairs are grey at the roots, and on the neck they are grey at the root, then buff colour: on the abdomen the hairs are white to the root. Dr. Richardson's measurements, which are from a mutilated skin, give 22 inches as the entire length of the animal, and 4 inches for the length of the ears.

According to Messrs. Lewis and Clark's account, quoted by Dr. Richardson, the animal weighs from seven to eleven pounds; its head, neck, back, shoulders, and the outer parts of the legs and thighs, are of a lead colour; the tail white: the fur long, dense, and soft. The animal assumes the above colouring from the middle of April till the middle of November; during the rest of the year it is of a pure white, with the exception of the black, and reddish brown of the ears, which never changes.

LEPUS CALIFORNICUS.

Californian Hare.

Lepus Californicus.	Gray, Magazine of Natural History for November, 1837, vol. 1 (New Series), p. 586.
" *Richardsonii.*	Bachm., Journ. of the Acad. of Nat. Sci. of Philad., vol. viii. p. 88.
" "	Wagner, Schreb. Säugth. Suppl. iv. p. 111 (1844).
" *Bennettii.*	Gray, Zoology of the Voy. of H.M.S. Sulphur—Mammalia, p. 35. Pl. 14 (1843).

Ears very large, much longer than the head; limbs long and slender; tail long: fur soft, moderate as to length; on the upper parts of the body pencilled with black and pale rufous-brown; on the chest, sides of the body, and outer surface of limbs, pale brown, more or less tinted with rufous; abdomen

white, suffused with bright rust colour, or with fawn-yellow: tail dirty brown-yellow below; black above: ears with a large black patch at the apex, externally: back of neck grey-white, brownish in the mesial line.

Inhabits California—"in the open hilly country which surrounds the harbour of St. Diego" (lat. 32° 04′).

I have before me, notes of ten nominal species of Hares, supposed, or known to be, inhabitants of the south-western portions of North America. Of these, one, which was described from a specimen in the Museum of the Zoological Society, from which the label had become detached and lost, was merely surmised to be a native of this part of America, as it was likewise of the southernmost part of South America, and was described under the name *Lepus longicaudatus*: this proves to be a South African animal, being, without doubt, the *L. saxatilis*. Of the remaining, so-called species, there are two of which I have only very short descriptions—they are the *L. cunicularius* and *L. Mexicanus* of the Berlin Museum[1]. Of the others I have detailed descriptions; and, in most cases, I have examined the specimens from which the original descriptions were drawn up. They appear to me to be clearly referrible to three species only; and the earliest names imposed upon them respectively, were *Californicus*, *Texianus*, and *callotis*. They are all nearly

[1] For notes upon these two species I am indebted to my friend Dr. Bachman. The note relating to the *L. Mexicanus* is brief, but leaves scarcely a doubt on my mind that that animal is specifically identical with the *Lepus callotis*. Judging from the description of the

Lepus cunicularius: Lichtenstein,

that animal must be nearly allied to the short-eared Hares of the United States. Its fur is said to be short, and coarse; the general hue of the upper parts of the body, brown-black; the hairs on these parts being of a pale ashy grey at the root, light brown in the middle, annulated with yellowish white towards the point, and with a long black point: ears, internally clothed with

equal in size to each other, and to the Common European Hare, and have long ears and long limbs. The *Lep. callotis* is readily distinguished by the terminal portion of the ear, externally, being white, or yellowish; in *L. Californicus* and *L. Texianus* the same part being marked with a large black patch: the points of distinction between the two last-named species are noticed in the account of *Lep. Texianus*. The Californian Hare is subject to considerable variation in its colouring, and more especially with regard to the colour of the flanks and limbs; in some specimens the rufous tint is tolerably bright and distinct, whilst in others there is scarcely any trace of the reddish hue on these parts. The upper parts of the body are strongly pencilled with black, and pale rufous-brown; the chest, the sides of the body, and the limbs, are rufous, slightly tinted with brown; the throat yellow-white; chin brownish, and abdomen white, suffused with bright, but pale, rust colour; the fore legs are considerably pencilled with black in front, especially towards the feet; the fore feet are brown-white; there is less of the red tint on the outer surface of the hind legs than on the sides of the body, and on the tarsus it is replaced by pale brown; the soles of the feet are dusky brown. The ears, which are very large, have the fore part of the outer surface, and the hinder part of the inner, clothed

short cream-coloured hairs; externally, pale grey-brown, but assuming a blackish hue towards the tip: back of the neck yellow; orbit of the eye, throat, and abdomen, white.

	Inches.	Lines.
Length from tip of nose to root of tail ...	15	6
" of tail	2	9
" of ear	3	5
" of tarsus	4	0

Inhabits Mexico.

I may here mention, that in the Leyden Museum I examined an animal labelled as coming from Mexico, which appeared to me to differ in no respect from the common Wild Rabbit of Europe.

with short, party-coloured, dusky and brown-white hairs; the fringe on the anterior margin is composed of yellow-white hairs, having dusky points; the hinder edge of the ear is cream-coloured, or, in parts, white; the tip is distinctly edged with black, and the black runs down from the point, on the hinder margin, for about half the length of the ear; on the fore margin, the black is much less extended: on the outer surface of the ear, at the apex, is a large dusky black patch, which is about an inch and a half in vertical diameter; the hinder half of the ear, below the black part, is of a dirty white colour. The back of the neck is brown in the middle line, and greyish white behind the ears. The tail is moderately long, of a dirty brownish yellow colour below, and black above to the point. The hairs on the back are grey-white at the root, have a broad black space in the middle, a sub-terminal ring of rufous brown (but very pale), and a black point: on the abdomen the hairs are white at the root.

This description is from the specimen upon which Mr. Gray founded the *Lepus Californicus*; its admeasurements are given in the first of the four columns of dimensions. Two other specimens, which, together with the one just noticed, are in the collection of the Zoological Society, and are the originals, I believe, of Dr. Bachman's descriptions, under the name *Lepus Richardsonii*[1]. They differ slightly from each other, and from the specimen described by Mr. Gray, but, after a careful comparison, I cannot doubt that the three animals are specifically identical. The tail in all is of a dirty yellowish colour beneath; and the back of the neck is grey-

[1] I regret that up to the present moment I have been unable to obtain the Eighth Volume of the Journal of the Academy of Natural Sciences of Philadelphia, in which Dr. Bachman describes the *Lepus Richardsonii*; the account, however, as extracted by Dr. Wagner in his Supplement to Schreber's Säugthiere, leaves little doubt on my mind that I am correct in regarding the specimens referred to, as those upon which that account was drawn up.

white, but more or less brown in the middle, and they have a large black patch on the outer surface of the ear. One of the specimens of *L. Richardsonii* differs from the animal from which my detailed description is taken, in having less of the rufous tinge on the chest and sides of the body; these parts are of a palish brown colour, with a faint rufous tint. The region of the shoulders is brown, and destitute of black pencilling. The second specimen differs in its general tint, being less brown—inclining to grey: its belly is yellow-white, and there is a very slight rusty tint about the base of the legs, and lower parts of the sides of the body. The legs are brown.

	Lepus Californicus.		*Lepus Richardsonii.*				*Lepus Bennettii.*	
	Ins.	Lines.	Ins.	Lines	Ins.	Lines.	Ins.	Lines.
Length from tip of nose to root of tail	22	6	21	0	21	0	19	6
" from nose to ear	4	6	4	3	3	10	4	0
" of ear	5	6	5	6	5	5	5	2
Width of ditto	3	0	3	0	3	0	2	10
Length of tail, including the fur	4	8	5	0			4	8
" of tarsus	4	10	4	10	4	10	4	9

The *Lepus Bennettii* of Mr. Gray, in its colouring, resembles the second specimen referred to in the foregoing account; that is to say, it is less rufous on the sides of the body than the specimen described under the name *L. Californicus*. Its dimensions are given in the fourth column. The following are the admeasurements of its skull:—

	Lepus Bennettii. British Museum. Inches.	Lines.
Length of skull from tip of intermaxillary bones to lower part of occiput[1]	3	5

[1] A very small portion of the occiput only is remaining in this skull, which, if perfect, would no doubt be about 3″ 7‴, or 3″ 8‴, in total length.

	Lepus Bennettii. British Museum. Inches.	Lines.
Width of skull	1	7⅔
Length between orbits		11½
Length of nasal bones	1	4⅙
Width of ditto behind		8⅓
" " in front		5⅔
" of upper incisors		2⅔
From upper incisors to molar teeth	1	0⅙
Length of six molar teeth, taken together ...		7
" of palate		3
" of lower jaw	2	6½
Height of ditto	1	6
Transverse diameter of angular portion ...		11⅓

LEPUS TEXIANUS?

Texian Hare?

Lepus Texianus. AUD. and BACHM., Quadrupeds of North America?

Legs long; ears very large—more than one-third longer than the head; tail long: fur long and soft; the general hue of the animal pale, inclining to ashy grey, but strongly mottled with black and brownish white, on the upper parts of the body; the throat and abdomen white; haunches, and outer surface of the legs, grey; tarsus nearly white; back of neck pale ashy grey; tail black above, and greyish beneath; a large black patch on the rump; ears with a large black patch at the apex externally.

Inhabits Texas?

A well-marked species of Hare, in the collection of the Zoological Society, of which the history is not known, is recognized by Mr. J. W. Audubon as a species with which he is well acquainted, and which that gentleman informs me will shortly be published in the great work on the North American Quadrupeds, which I have already frequently quoted. According to Mr. Audubon, to whom we are indebted for the

splendid plates which illustrate the work alluded to, the animal inhabits Texas, and has been named *Lepus Texianus*. In its colouring, the specimen alluded to, agrees more closely with the *L. callotis* than with the Californian Hare, but it resembles the latter in having a large black patch at the tip of the ear, and in having the back of the neck pale: its limbs are apparently proportionately shorter, and less slender than those of the animals just mentioned, and it differs from them, in a marked degree, in the relative size of its ears. The black patch, on the hinder part of the back, and which is hidden by the recurved tail, it seems, is found likewise in the *Lep. callotis*. The hairs on the upper parts of the body are white (*very* slightly tinted with grey) at the root, brownish towards the middle, black above the middle, have a broad sub-terminal pale ring, which is almost white, but shaded into reddish near the black with which the hair is pointed. The throat and abdomen are white, but a slight yellow tint is observable on the latter part. The feet are dusky grey beneath. The fore legs are of a pale ashy grey colour in front, and obscurely pencilled with dusky. The fore part of the ears, externally, and the hinder part, internally, are clothed with party-coloured, dusky, and yellow-white hairs; the fringe on the anterior margin is composed of long dirty yellow hairs; the hinder margin is white; with the exception of the part already noticed, the inner surface of the ear is clothed with pale hairs, yellowish near the point, and white below that part; the tip of the ear is fringed with brown-black hairs, and a similar dark edging runs down the hinder margin for about two inches from the point; the hinder half of the ear, externally, is white, if we except the apical portion, where there is a large dusky black patch of about an inch or more in vertical diameter. The tail is black above, and at the point, and dirty greyish white below: here the hairs are grey at the root. The orbit of the eye is whitish.

Lepus nigricaudatus. BENNETT.

In applying the name Black-tailed Hare to the present animal, Mr. Bennett merely wished to call attention to the fact, that its tail had more black than usual in its colouring; in very many Hares the black is confined to the upper surface of the part in question, whilst in the *L. nigricaudatus*, the tip and the sides of the tail are also sooty black, the white of the under surface being almost confined to the root of the tail. As the *L. nigricaudatus* presents all the general features which have been noticed as appertaining to the *L. callotis*, I shall merely add, that the fur on the upper parts of its body is composed of long and soft hairs, which are pale grey at the root; above the grey, a long space on each hair, is of a pale rufous colour, this is followed by a dusky or blackish space, a broad, pale rufous-yellow ring, and a black point: the sides of the face are chiefly yellow; the chest yellow; the back part of the tibia dusky grey, and the dense fur on the soles of the feet is of a dirty blood-red.

	Lepus callotis. From Wagner.		*Lepus flavigularis.* From Wagner.		*Lepus nigricaudatus.*		*L. Mexicanus.* Licht. From Bachman.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length from tip of nose to root of tail	18	6	21	9	19	9	18	0
" from ditto to ear	4	0	4	0	3	11		
" of ear	5	2	5	2	4	10	5	7
Width of ditto					2	8		
Length of fore foot and leg to the elbow joint, about ...					7	0		
" of the tarsus	4	8	4	9	4	7	4	9
" of tail, including the fur	2	9	3	0	3	0	2	2

The brief note relating to the *L. Mexicanus* of the Berlin Museum, furnished me by Dr. Bachman, describes that animal as having the back of the neck black; the white of the under parts of the body extending high up on the flanks, and, indeed, in all other respects agreeing with the characters of *L. callotis*.

South American Hares.

Hitherto but one species of Hare has been found in South America.

LEPUS BRAZILIENSIS.

Brazilian Hare.

Lepus	*Braziliensis.*	LINN., Syst. Nat., 12th Ed., i. p. 78.
"	"	SHREB., Säugth. iv. p. 902.
"	"	DESMAREST, Mammalogie, Pt. 2, p. 352.
"	"	WAGNER, Shreb. Säugth. Suppl. iv. p. 116.
"	*Tapeti.*	PALLAS, Nov. Spec. Glir. p. 30.
"	*Tapiti.*	BUFFON, Histoire Naturelle, tom. xv. p. 162.
"		AZARA, Essais sur l'Histoire des Quadrupèds de la Province de Paraguay, 8vo. Paris, 1801, tom. ii. p. 57.

Ears small; tail very short; tarsus short: fur of moderate length, and rather coarse; upper parts of the body distinctly mottled with black and ochreous-yellow; region of nostrils, orbits of eye, throat, and abdomen, white: legs rust coloured; tail brown above, rufous-yellow beneath; ears with yellow hairs internally, and chiefly brown externally; back of neck bright rufous.

This species is scattered throughout Brazil, and is found likewise in Peru, Bolivia, and Paraguay.

The Brazilian Hare, in affinity, approaches most nearly to the *Lepus palustris*, and certain other North American species in which the ears and feet are short, and the latter are

less densely clothed with fur than usual; it bears, likewise, a considerable general resemblance to the *Lepus nigricollis* of India, but is smaller than either of these animals, and is readily distinguished by its extremely short tail, which is almost hidden by the fur of the haunches. The bright rust colour of the back of its neck, moreover, will prevent its being confounded with the Black-necked Hare. Its fur is by no means long, and is much less soft than in the Common Rabbit; the hairs on the back are grey at the root, and brownish above; and each hair is shaded into black near the sub-terminal pale ring, which is partly ochreous white, but assumes a rich ochre colour towards the point, which is black; on the upper parts of the body, where the black terminal part of each hair is long, the fur is strongly mottled, or variegated with black and ochreous yellow, but on the sides of the body there is much less black in the colouring. The white in the region of the eye is considerably extended near the angles, and is very conspicuous, as is also the white mark which surrounds the nostril opening. The throat and abdomen are white, and the hairs on these parts are uniform in colour to the root, or, an extremely faint grey tint is sometimes seen on the hairs of the abdomen next the skin. The limbs are of a tolerably bright rust colour, but the fore parts of the hind leg, and the upper surface of the tibia, are almost white; and the hinder surface of the tibia is sometimes brown. The ears are clothed with rusty yellow hairs internally, and there are no party-coloured hairs near the hinder margin as is usually found in the species of the present group: the outer surface is clothed for the most part with brownish hairs; those on the fore part are, however, pencilled with black. The tail is rufous yellow beneath, and the hairs on the upper surface are coloured like those of the upper parts of the body.

The above description is taken from specimens brought

from Bolivia by Mr. Bridges, and which are now in the British Museum. An extremely young specimen from the same collection, measuring about four inches in length, is almost entirely black on the upper parts of the body: the ears are entirely of a bright rust colour internally, and black externally at the point, and along the anterior margin; the cheeks are chiefly black, and the upper surface of the head is chestnut-brown; throat and abdomen white; orbit yellow-white; legs rufous.

	Inches.	Lines.	Inches.	Lines.
Length from tip of nose to root of tail	13	0	15	0
" from nose to ear, about ...	2	6	2	6
" of ear	2	0	2	0
Width of ditto	1	4	1	4
Length of hind foot	2	10½	3	0
" of tail, including the fur, about	1	3		

The skull removed from one of these specimens, and a second skull in the British Museum, sent from Para, agree most closely with each other, as will be seen upon comparing the subjoined dimensions. Like the skull of the Common Rabbit, they have the inter-orbital space narrow, as compared with the same part in the more typical Hares, owing to the supra-orbital process being but little developed in the lateral direction; a small notch marks their anterior boundary, and the produced free hinder portion is less elongated than in the Rabbit's skull. The peculiarities of the skull of the Brazilian Hare will perhaps be rendered more evident, by our continuing a comparison between it and the skull of the Common Rabbit. Viewing the upper surface, the most striking distinctions are as follows:—the facial part of the cranium are much shorter; the nasal bones are not only shorter from this circumstance, but likewise from the fact that they terminate posteriorly at a point more advanced, or more removed from the angle of the orbit: in the Rabbit the nasal bones terminate in a line, which, if carried out, would

be rather behind the point of the orbital process of the superior maxillary bone; whilst in the Brazilian animal, in which the skull is considerably smaller, the nasal bones terminate more than $\frac{1}{12}$ of an inch in front of the corresponding part of the superior maxillary bone. The upper surface of the skull is less arched, and the frontal and parietal bones are remarkable for having small punctures more or less thickly scattered over their surface, which are visible, in a much less degree, in the Common Rabbit. The nasal bones, on either side, at the termination of the anterior third part of their length, have a smallish concave area, in which several perforations are visible. Besides these points, I shall merely notice, that the palate is relatively longer than in the Rabbit, and the post-palatal channel is less contracted. The lower jaw, besides being proportionately shorter, has the ascending ramus less directed backwards, and its antero-posterior diameter is considerably smaller, arising chiefly from the ridge, corresponding to the coronoid process, being much less developed. Now, in all these characters, and in several other minute points—in the form of the auditory bullæ, and the palatine opening, &c.—a fossil skull from the caverns of Minas Geraes most perfectly agrees. This fossil skull, indeed, has *all* the peculiarities of that of the living species of the country, but differs in being about one-third larger, and the same difference is likewise observable in parts of two other fossil skulls, from the same caverns, and in several lower jaws, which are more or less imperfect. I will arrange the dimensions of the fossil skull next to those of the recent.

	Recent. Bolivia.		Recent. Para.		Fossil.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Total length of skull	2	6½	2	7	2	11
Width	1	2¾	1	3¼	1	5[1]
" between orbits		7⅓		7¼		
Length of nasal bones	1	0		11⅔		
Width of ditto behind		6		6		6¾
" " in front		4		4¼		4½
From front of intermaxillary bone to hinder margin of nasal bones		11⅔		11	1	0
Length of palatine opening		8		7½		9
Width of ditto behind		3		3¼		3⅜
Depth of zygomatic arch		2		2		
Antero-posterior diameter of palate ...		3		3		3¼
Length of six upper molar teeth taken together		6		6		7¼
Width of upper incisors		2⅛		2⅛		
Length of lower jaw	1	11	1	11		
Height	1	1½	1	2½	1	4
Antero-posterior diameter of ascending ramus, taken in the middle		4¾		4 ¾		5⅔

Fossil species of Lepus.

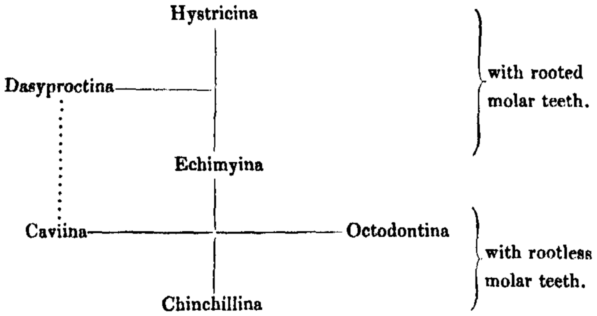
Already have been noticed some remains, found in the caverns of Brazil, appertaining to a Hare which is exceedingly close to the recent species—*Lepus Braziliensis*. The bones referrible to the Hare genus found in the European deposits, and chiefly in the caverns, in like manner agree for the most part very closely with the recent species of the country.

I have before me several lower jaws, and some other parts of the skeletons of Hares from Kirkdale cavern, and from

[1] The width of two other fossil skulls, according to portions preserved in the British Museum, is respectively—1·4¼ and 1·3⅔; length of the six molars, taken together, 6½ lines.

or three species in the West Indian Islands, and about the same number in central America, form the exceptions. The members of the sub-families *Hystricina, Dasyproctina,* and *Echimyina*, increase in number towards the tropical portions of South America; whilst, in the southern parts of that continent, the less highly organized species only are found, these being members of the remaining three sub-families. On the western side of the Southern Andes but one of the subsections alluded to has representatives—the *Octodontina.*

The relations which the sub-families of the *Hystricidæ* bear to each other may be expressed by arranging them as follows:—



By this mode of placing the groups, we wish to express that the Agoutis (*Dasyproctina*), in their characters, partake of those of the three groups to which they are approximated; that certain members of the section *Echimyina* lead off to the *Hystricina,* whilst others approach more nearly to the Chinchillas; and, lastly, that the Octodons are nearly related, on the one hand, to the *Echimyina*, and on the other, to the Chinchillas: they bear the same kind of relationship to the *Echimys* group as do the *Arvicolæ* to the true Rats. That such is the case we shall endeavour to shew when treating of the groups separately.

With regard to my definition of the family *Hystricidæ*, it

is necessary to observe that, in the Cavies, where the lower incisor is short, the angular portion of the jaw cannot strictly be said to spring from the outer surface of the bony covering of that tooth, though the direction of the incisor is such that, were it prolonged backwards, the alveolus of the tooth, and the angular portion of the jaw, would hold the same relative positions as in the other *Hystricidæ*[1]. Usually the incisors in this family are large and long; and, on viewing the under surface of the lower jaw, a longitudinal groove separates the dentary and angular portions. The latter is almost always of a triangular form, and usually terminates behind in an acute angle. Commonly the masseteric ridge is well developed, and gives a somewhat expanded, flattened surface to the lower edge of the jaw, which is broadest near the middle, being dilated at that part so as to form an obtuse angle on the inner side of the ramus. This angular projection, which is not found in other groups of Rodents, is very distinct in the *Echimyina* and *Octodontina*[2], but either disappears, or becomes indistinct, at the extremes of the family, as, for example, in most of the *Hystricina* and *Caviina*. Besides these points, the small size of the coronoid process is very characteristic of the Hystricine family, having relation to

[1] The transitional forms which link the structure of jaw which is characteristic of the Cavy, with that which is usual in the *Hystricidæ*, are found in the lower jaw of the animals belonging to the genera *Dolichotis*, *Lagotis*, and *Lagostomus*. In *Dolichotis* the incisors are somewhat more elongated than in the typical Cavy; in *Lagotis*, the incisors, which are still comparatively short, yet extend as far back as the line of the springing of the angular portion, or descending ramus of the jaw—here we begin to trace the angle on the inner side of the ramus; and, in the closely allied genus, *Lagostomus*, the angle is distinct, the incisors longer, and the angular portion of the jaw is attached to the outer side of its alveolus. In the *Sciuridæ* and *Muridæ* the corresponding part of the jaw invariably springs from the *under* surface of the dental portion.

[2] Excepting the genus *Habrocoma*, where the angle in question is very obtuse; it is unusually far back in *Octodon* (see fig. 2 *b*, of Plate 8), and is very prominent in *Ctenomys* (fig. 6 *b*, Plate 8).

ture of muzzle to that of fig. 9, which represents the common form of that part in the *Muridæ*; and that, notwithstanding *Capromys* and *Lagostomus* are genera of distinct and well-marked sections of the *Hystricidæ*, yet in the structure of the terminal part of the muzzle, or muffle, there exists a far greater similarity in these genera than exists between either of them, and the Murine Rodent; not only in the expanded form of the muffle, but in the fact that that part is clothed throughout with velvet-like hairs, whilst in the Rats it is naked.

Beyond these points, I will merely here call attention to the form of the ear, which always, or nearly always, has the hinder edge emarginated in the present group of animals.

Sub-family CAVIINA.

Hystricidæ with rootless molar teeth, divided by folds of enamel so as to form lobes having acute angles; the series of molars on opposite sides of the upper jaw converging, and nearly meeting, in front; incisor teeth comparatively short, those of the lower jaw not being extended backwards as far as the springing of the angular portion, or descending ramus; four toes to the fore feet, and three to the hind; tail wanting, or rudimentary; upper lip entire: a strongly-developed horizontal ridge on the outer surface of the lower jaw: the angular portion of this jaw produced much beyond the condyloid portion, descending below the level of the dental portion, and with a curved lower margin: clavicles wanting.

The Cavies have almost invariably been associated with the Agoutis (*Dasyprocta* and *Cœlogenys*), and frequently the animals of both divisions have been linked together, under the sectional name *Subungulata*, by the more recent writers, who thus adopt Illiger's name for the section, and his views

regarding it[1]. I am satisfied that the nature of the affinity which exists between these two groups is by no means so near as we are generally led to suppose.

Both groups belong to the same great family; and, besides the characters which are peculiar to this family, the species of the genus *Dasyprocta* may be said to approach the Cavies, from the circumstances of their having the same number of toes to the feet, and being almost (or entirely) destitute of a tail; but this I maintain to be weak evidence in favour of the supposition that there exists a very near affinity between the genera associated in this work under the name *Caviina*, and those arranged under the head *Dasyproctina*; such an affinity, in fact, as is indicated by the arrangement of these two groups in a section apart. A certain degree of importance must be given to the characters just referred to, when we find them *combined* with numerous other peculiarities exhibited in the structure of the teeth, skull, and skeleton, as in the *Caviina*, but evidence of a distinct minor type, in the structure of these parts, will be educed when we treat of the *Dasyproctina*.

A remarkable structure of the fauces, or entrance to the throat, has been pointed out by Mr. Morgan in the Capybara

[1] The characters of the section *Subungulata*, given by Illiger, will apply to the whole of the great Hystricine section of Rodents (*Hystricidæ*), as defined in this work, if we except one phrase only, viz. "*Corpus pilis solis tectum*;" and, with regard to this phrase, I have only to observe, that in one of the genera of the *Hystricidæ* (*Nelomys*), there are species, some of which are clothed with spines, and others in which the clothing consists of soft hairs only. I object to the name *Subungulata*, because it is only applicable to some of the species of the group, as Illiger was well aware, since in his definition he says—"*Ungues falculares, paucis postici subungulæformes*;" because it is more applicable to some other groups of Mammalia; and, lastly, because other, more convenient and less objectionable, names for families, than those framed upon the same principle as the name under consideration, have been proposed and generally adopted—as, for instance, names taken from the leading genus in the family: such names have many advantages; amongst others, they at once give an approximate idea of the contents of the group.

and Guinea Pig, and is probably constant in the present subfamily: it consists in the fleshy lining of the mouth, at this part, being continued so as to form a funnel-shaped cavity, which passes backwards into the pharynx, into which it opens by a very small aperture, incapable of admitting the passage of any but well masticated food. The walls of this funnel-shaped cavity, moreover, are supplied by muscles by which its circumference may be dilated or contracted, and when produced, this conical prolongation of the *velum palati* passes over the epiglottis, so that the entrance of any particle of the food into the larynx is prevented[1]. The stomach is simple, but the cœcum is large and complicated in the Cavy group. The molar teeth are generally divided by a deep fold of enamel into two principal lobes; those of the upper jaw have the entering fold of enamel on the inner side, whilst those of the lower jaw have the corresponding fold on the outer side. The palatine portion of the skull in front of the molars is much contracted, and the incisive opening is small; between the molars, the palate assumes a triangular form, being contracted in front by the convergence of the molars to that point; the post-palatal emargination is usually deep, and leaves exposed the anterior sphenoid bone; the auditory bullæ are moderate; the occipital condyles very narrow, and the occipital opening is comparatively large. In the structure of the lower jaw is found a well-marked character, which distinguishes the species of the present section from all other Rodents, and that is a peculiar ridge (shewn in the figures on Plates 4 and 6) extending along the outer side of the lower jaw, commencing opposite the first molar tooth, and at first running horizontally backwards, but recurved towards the hinder extremity, to run up to the condyloid portion of the

[1] For a more detailed account of the structure of the fauces in the Capybara, the 16th Volume of the *Linnean Transactions* must be consulted—see p. 465.

jaw: it is much protruded in all the Cavies, and most so in the more typical species, where the upper surface of the protruded part is strongly concave in the transverse direction. The condyloid portion of the jaw is remarkable for being but little elevated above the crowns of the molar teeth, and the extremely small coronoid process reminds us of the condition of the same part in the Tailless Hares (*Lagomys*): indeed, the Cavies approach the Hares in many particulars, most of which are more strongly marked in the Patagonian Cavy.

Genus *Dolichotis*.

Dolichotis. DESMAREST, Mammalogie, Part 2, p. 360. 1822.
Mara. LESSON, Centurie Zoologique, p. 113. 1830.

Caviina with the limbs long; the ears fully half as long as the head, pointed, broad at the base, and deeply emarginated behind; tail very short, and recurved; metatarsus with the anterior half clothed with hairs on the under surface; the hinder half, as well as the heel, naked; molar teeth small, compared with the bulk of the skull; the three foremost of the upper jaw, and the three hindermost of the lower, divided by folds of enamel, each into two equal lobes; the last molar of the upper jaw three-lobed, as well as the foremost of the lower jaw (Plate 4, fig. 1 B).

The comparatively large size of the ears, and the long legs of the Patagonian Cavy, (the only species contained in this genus) give to it a very different aspect to that of the ordinary Cavies, and these characters, combined with the presence of a distinct, though short, tail, form the chief generic distinctions.

The structure of the skull (Plate 4, fig. 1) of the Patagonian Cavy more nearly resembles that of the *Cavia rupestris* than other species of the Cavy group[1]; and these two

[1] The skull of the Patagonian Cavy more nearly resembles that of the *Cavia rupestris* than that of the *Cavia Cobaya*, in its more elongated form, and more especially in the greater length of the facial portion; in the greater depth between the orbits; the shorter and more rounded form of the hollow formed by the junction of the orbital and temporal cavities; in the smaller size of the

animals agree in having the angular portion of the lower jaw deeper and less developed than in the more typical Cavies. The projecting ridge on the outer surface of the lower jaw is less sharp in the Patagonian Cavy than in the species of the genus *Cavia*, and, being very little recurved, the upper surface of the ridge is but slightly concave. In the structure of the teeth, the *Dolichotis Patachonica* agrees very closely with the *C. rupestris*, but in the former animal the principal fold of enamel of the molars is met by a distinctly indenting fold from the opposite side of the tooth; and the supplementary lobe of the last upper molar is broader than in *C. rupestris*, being nearly of an oval form: the notch which separates it from the second lobe is much more deep and distinct.

The Cavies, generally, evince an approximation to the Hares in the comparative shortness of their incisor teeth, the imperfect condition of the palate, which, from being short, and deeply emarginated behind, leaves exposed the sphenoid bones, the narrow form of the bodies of the sphenoids, and the small brain cavity. The facial part of the skull, however, is not so large in proportion as in the Hares, and the skull is more depressed, and wants the great supra-orbital processes, and the large incisive openings, which form some of the many characteristics of the Hare's skull. With these evidences of an approximation between the Cavies in general, and the Hares

portion of the palate which lies between the molar teeth, and in the malar bone being produced into a distinct angle above, forming a post-orbital process. The malar bone, however, rises vertically to form this angle, in the Patagonian Cavy, immediately above its point of union with the zygomatic process of the temporal bone, whilst in the *C. rupestris* the angle is rather more advanced in position: no such angle exists in the malar bone of *C. Cobaya*. The ridge forming the upper boundary of the ant-orbital opening is less prolonged, in the animal under consideration, than in the typical Cavies, terminating, as it does, in the same vertical line as the fore part of the root of the zygoma. The lachrymal bone is here larger than usual, descends so as nearly to join the malar bone, and is interposed between the upper and lower processes of the superior maxillary bone, which, in the true Cavies, generally meet and form a perfect ring enclosing the ant-orbital opening.

(which, nevertheless, are separated by many important differences), it is interesting to find, in the Patagonian Cavy, a link uniting the two groups still more closely together—here the cerebral portion of the skull is short, deep and arched, and the facial portion immensely developed, the nasal bones very large, and, unlike the other Cavies, very convex above; the orbits large, approximated in the mesial line of the skull, and protected above by a strongly-developed supra-orbital ridge, presenting a distinct notch above the eye, and with the hinder extremity separated from the body of the frontal bone by a fissure; the palate so little extended, that not only are the sphenoids exposed, but even the vomer comes into view. These points, which approximate the Patagonian Cavy to the Hares, however, it must be observed, are none of them so strongly marked, in the animal under consideration, as in the *Leporidæ*.

In the scapula of the Patagonian Cavy, we find not only the descending branch of the acromion process, as in the genera *Cavia* and *Lepus*, but an equally long ascending branch also exists: the spine is separated from the body of the scapula, in front, by a very deep emargination, as in the Hares and typical Cavies, and, indeed, the deep emargination at this part is found in most of the *Hystricidæ*, and forms a striking point of distinction when the scapula of the true Rat is compared with that of the Rat-like animals of South America, forming the genus *Echimys*; or when the scapula of the Beaver of the northern hemisphere is compared with that of the Coypu (*Myopotamus*) of South America, which by many naturalists is erroneously associated with the Beaver.

DOLICHOTIS PATACHONICA.

The Patagonian Cavy.

(*Plate* 3, fig. 1).

Cavia Patachonica.	SHAW, General Zoology, vol. ii. Part i. p. 226, Pl. 165 (1801).
" "	WATERH., Zool. of H.M.S. Beagle, Mammalia, p. 89 (1839).
Dasyprocta Patachonica.	DESMAREST, Journal de Physique, 1819, tom. 88, p. 205; Mammal. Part 2, p. 358 (1822).
Chloromys Patagonicus.	LESSON, Manuel de Mammal. p. 301 (1827).
Mara Magellanica.	LESSON, Centurie Zoologique, p. 113, Pl. 42 (1830).
Dolichotis Patagonica.	WAGNER, Schreb. Säugth Suppl. iv. p. 66. (1844).
Patagonian Cavy.	PENNANT, Hist. of Quadr., ed. 1781, vol. ii. p. 363, Plate No. 234.
Lièvre Pampa.	AZARA, Essais sur l'Hist. Nat. des Quadr. de la Province du Paraguay, French transl. vol. ii. p. 51 (1801).

Fur dense and crisp; on the upper parts of the head and body grey, on the sides of a yellow-rust colour; chin, throat, and abdomen, white; rump black, but with a broadish white transverse band crossing immediately above the tail: limbs for the most part rusty yellow, but greyish in front.

Inhabits Patagonia, ranging from about 48° 30′ in the South, to 37° 30′ on the East coast, and extending into La Plata as far north as Mendoza.

"The Patagonian Cavy," Mr. Darwin observes, "is found only where the country has a desert character. It is a common feature in the landscape of Patagonia, to see in the distance two or three of these Cavies hopping one after the other in a straight line over the gravelly plains, thinly clothed by a few thorny bushes, and a withered herbage. Near the coast of the Atlantic, the northern limit of the species is

formed by the Sierra Tapalguen, in latitude 37° 30′, where the plains rather suddenly become greener, and more humid. The limit certainly depends upon this change, since near Mendoza (33° 30′), four degrees further northward, where the country is very sterile, the animal again occurs. Its southern limit is between Ports Desire and St. Julian, about 48° 30′." From the same source[1] we learn the following particulars relating to the habits of this Hare-like Cavy. It is a burrowing animal, but when found in the same districts with the Viscacha it will avail itself of the excavations of this latter animal for a retreat. The Patagonian Cavies wander at times to great distances from their homes, and usually two or three are seen together on these occasions. The animal, in its mode of running, more nearly resembles the Rabbit than the Hare, and, though its limbs are long, it does not run very fast: it seldom squats after the manner of a Hare, is very shy and watchful, and feeds by day; and, in connexion with this circumstance, I may mention that the eyes, like those of the Kangaroos, are defended from the direct rays of the sun, by well-developed eye-lashes, which is not the case with the ordinary Cavies. It generally produces two young at a birth, and brings forth in its burrow: its flesh is white when cooked, but rather dry and tasteless.

The long legs, and tolerably long erect ears, combined with the general form of the head, and the short recurved tail, have caused this animal to be very generally mistaken for a Hare, by casual observers, and we have pointed out certain other characters in which the resemblance is further borne out; it nevertheless is a Cavy in all the more essential details of structure. In size, it greatly surpasses the Common Hare, full-grown individuals weighing from twenty to thirty-six pounds, and, indeed, the Patagonian Cavy must

[1] Zoology of H.M.S. Beagle.

rank amongst the largest of the Rodent tribe, though far surpassed by its aquatic congener, the Capybara. The head is large, and terminates in a blunt muzzle, which is entirely clothed with hairs, even in the mesial line, if we except an exceedingly narrow space, of about half an inch in length, between the muffle and the upper lip, which is naked. The upper lip merely presents a slight angular notch above the incisor teeth. The ears are very broad at the base, and pointed at the opposite extremity, and, being rather deeply emarginated behind, the upper half is thus somewhat suddenly contracted in width. Unlike other Cavies, the hind feet are in a great measure clothed with hair beneath; the under surface of the toes, however, is naked, and there is a long callous pad on the heel. The fur of the animal is moderately long, somewhat crisp to the touch, and very dense; on the upper parts of the head and body, it is of a grey hue, being finely freckled with black and dirty yellow-white; on the sides of the head and body, as well as on the chest, the fur is of a bright yellowish rust colour, varying in intensity in different parts, and is most rich on the lower part of the cheeks, where the hairs are very long. The prevailing hue of the legs is rusty yellow—paler than on the sides of the body—and inclining to ashy grey on the fore part of the fore legs. The tarsi are of a pale brownish colour above, but rufous at the sides, and a rich rufous hue is observable on the hinder part of the posterior limbs, above the heel: the outer surface of the thigh is greyish; the terminal portion of the muzzle, the chin, throat, and abdomen, are white; on the last mentioned part not very pure, being slightly suffused with rusty yellow. The rump is black, but on the haunches is a transverse, broad, white patch; and a narrow white band, crossing immediately above the tail, connects the two patches of the opposite sides of the body. The hairs of the moustaches are black, and very long. The ears are tolerably well clothed with hairs, and

these are for the most part of a rusty yellow colour, but near, and at the hinder margin—on the inner surface of the ear—spring numerous long and very slender black hairs, and on the fore part of the ear externally, as well as at the point, are similar hairs. The short and thick tail is rather sparingly clothed with rusty yellow hairs at the base, and is quite naked at the point.

The above description is taken from a specimen in the British Museum collection; other specimens in the same collection show that the colouring of the animal varies somewhat in intensity in different individuals; the rusty yellow hue on the sides of the body being sometimes paler, and less bright, than in the specimen described: and the hairs on the inner surface of the ears being occasionally very pale.

	British Museum.		Zoological Society.	
	Inches.	Lines.	Inches.	Lines.
Length from tip of nose to root of tail	30	0	34	0
" from ditto to ear	4	10	5	0
Height of the animal at the shoulders, about	13	0		
Length of the ear	3	4	3	2
Width of ditto at the base	2	11		
Length of fore leg and foot, about ...	9	0		
" of fore foot (without including the nails)	2	0		
" of the longest nail		6		
" of hind foot, exclusive of the nails	7	2	7	3
" of the nail of the middle toe		10		
" of the tail, about	2	0	1	4
" of skull	5	4	4	$9\frac{1}{2}$
Width of ditto	2	7	2	$4\frac{1}{4}$
" between orbits	1	9	1	$6\frac{1}{2}$
Length of nasal bones	1	10	1	5?
Width of ditto behind		$10\frac{1}{2}$		$8\frac{2}{3}$
" " in front		$9\frac{1}{3}$		$8\frac{7}{8}$
" of upper incisor teeth ...		$3\frac{3}{4}$		$3\frac{1}{8}$
Between incisor and molar teeth—upper jaw	1	9	1	$6\frac{2}{3}$

	British Museum. Inches.	Lines.	Zoological Society. Inches.	Lines.
Length of four upper molars, taken together	1	1		11¼
Average width of upper molars ...		2⅔		2⅓
Width between hinder molars ..		11¼		
" between front molars		1		
Length of lower jaw	3	9	3	5
Height of ditto, behind ...	1	7	1	5

The dimensions in the second column are taken from a skull in the Leyden Museum; those in the first, are from the skull of the animal which is the original of my description.

Genus, *Cavia*.

Cavia. KLEIN, Quadrupedum Dispositio, p. 49 (1751).
Anœma. F. CUVIER, Ann. du Mus. xix. p. 292 (1812).
Les Cobayes. CUVIER, Règne Animal (ed. 1817); ed. 1829, p. 220.

Caviina with short limbs, and the ears likewise short; feet naked beneath; molar teeth nearly of equal size; each molar with two principal lobes.

The short-footed Cavies, having the molar teeth nearly equal in size, present two well-marked modifications in the structure of these teeth, the one exhibited in the Common Guinea-Pig, and the other in the *Cavia rupestris*. Perceiving these differences, F. Cuvier, in his *Dents des Mammifères*[1], instituted a new genus, under the name *Kerodon*, for the reception of the latter animal, which was found to differ from the *Cavia Cobaya*, and its allies, in the structure of its toe-nails, as well as in the teeth. Subsequently, new species of Cavies were discovered, having the same type of dentition as the *C. rupestris*, but in which the claws retained the form found in the Common Guinea-Pig, and it then became a question, to which of the characters—that furnished by the teeth, or that observed in the structure of the claws or nails—we should give the greater weight. I confess I cannot regard

[1] P. 151, Pl. 48 (1825).

either of the differences as of sufficient importance for the establishment of a genus, but am inclined to consider the structure of the teeth as of higher value than that of the nails, and think it desirable to adopt M. F. Cuvier's division, as a section of the genus *Cavia*, only.

Section, or Sub-genus, *Cerodon*[1].

Caviæ with the two lobes of the molar teeth equal, or very nearly so; the hinder lobe of the upper molars without any distinctly indenting fold of enamel.

Here the upper molar teeth have each a deep fold of enamel on the inner side, which penetrates the body of the tooth so deeply, that it touches the enamel on the opposite, or outer side; in this latter part the enamel merely forms a waved line (viewing the crown of the tooth), being indistinctly bent inwards in the middle of each lobe (as in *C. rupestris*), or forming a slight notch in, or near the middle of, each tooth, in some other species, as in *C. Australis*. The hindermost upper molar differs from the rest in having a small posterior lobe, or process thrown backwards from the second principal lobe. The molars of the lower jaw resemble those of the upper, but are reversed in position, have a more or less deeply indenting fold of enamel (marked *a*, in figs. 1, 2, 4, &c.) in the hinder lobe, running parallel with, and close to, the principal fold (in this respect differing from the molars of *Cavia* proper—Pl. 6, fig. 9); and it is in the foremost molar that a small extra lobe is found, projecting from the front of the tooth. The molars are relatively smaller in *Cerodon* than in *Cavia* proper. Figs. 2 *b*, of Pl. 4, and figs. 3, 5, and 7, represent the second upper molar tooth of various species of the *Cerodon* section; and the two foremost

[1] From Κέρας, a horn, bow, &c.; and ὀδούς, a tooth.

molars, of the lower jaw of the Cerodons, are represented on Pl. 6, figs. 1, 2, 4, 6, and 8.

CAVIA (*Cerodon*) RUPESTRIS.

Rock Cavy.

Cavia rupestris.	PR. MAXIMILIAN, Isis, 1820, p. 43; Beiträge zur Naturgeschichte Brasiliens, ii. p. 466 (1826); Abbildungen zur Naturgesch. Bras. 1822—31.
Kerodon Moco	F. CUVIER, Dents des Mammifères, p. 151 (1825); Dictionnaire des Sci. Nat.
" *sciureus.*	IS. GEOFFROY, Dict. Class. d'Hist. Nat., ix. p. 120, (1826).
Cerodon rupestris.	WAGNER, Schreb. Säugth. Suppl. iv. p. 69 (1844).
Rock Cavy.	PENNANT, History of Quadr., ii. p. 362 (1781).

Nails of the toes short, obtusely pointed, and scarcely projecting beyond the large fleshy pads with which the toes are terminated; fur soft, its general hue grey, tinted with rufous on the hinder parts of the back; throat white; chest whitish; abdomen white, suffused with pale ochreous yellow; sides of face tinted with rufous; hinder part of the posterior limbs suffused with chestnut-red: fore legs and tarsi whitish, tinted with rufous.

Inhabits Brazil, in rocky situations.

The Rock Cavy, according to Prince Maximilian, inhabits the interior of Brazil, and is confined to rocky districts, where it seeks its retreat in holes amongst the fragments of the rocks. It is frequently met with at Belmonte, Rio Pardo, and Rio de St. Francisco (all nearly under the 16th parallel of south latitude), being found near the rivers, but always in the higher parts of their course. Its flesh is said to be well flavoured, on which account it is sought by the Indians, to whom it is known by the name *Hokê*, and by the Portugese it is called *Mokó*.

The *Cavia rupestris* is superior in size to most other Cavies, stands higher on its legs, and is remarkable, in its group, for the comparative softness of its fur, and the structure of the nails of the toes. The feet are entirely naked beneath, and the toes are terminated by rather large fleshy pads, on which lie the short and blunt nails, which scarcely project over the fleshy portion of the toe: a large trilobed fleshy cushion is situated at the root of the toes of the fore feet, which, like those of the hind feet, have four or five transverse incisions on the under surface, and there is a large, naked, and rounded carpal pad. A nearly similar tri-lobed pad is found at the roots of the toes of the hind feet, behind which is a narrow transverse groove, and the remaining portion of the sole of the foot is protected by a smooth, flat, and hardened skin. The nail of the inner toe of the hind foot differs from that of the other toes in being larger, and in projecting considerably beyond the fleshy portion of the toe; it is thin, and hollow beneath, and, viewed from above, it presents a straight outline on the side next the other toes, and is rounded on the opposite side: this nail, I feel no doubt, is used by the animal to clean its dense and soft fur. The general hue of the upper parts is grey, the fur on these parts being distinctly pencilled with black and white; they are of a grey-brown colour at the root, black at the point, and annulated with greyish white near the point; on the crown of the head the black prevails, but on the back the black and pale colour are about equal in proportions; the hinder part of the back assumes a brownish tint, owing to the pale sub-terminal ring of each hair being of a rufous white hue at this part; and the rump, and hinder part of the hind legs, are of a reddish chestnut colour. The throat is white, the chest whitish, and the abdomen white, suffused with pale ochreous yellow; the hairs, however, are of a grey-brown colour at the root on this last mentioned part; between the hind legs is a white patch.

A rufous yellow tint prevails on the sides of the head, which is most bright in the region of the eye, and between that organ and the ear; the ears are clothed for the most part with pale yellowish hairs; the fore legs are whitish, suffused with pale rufous; the inner surface of the wrist is clothed with very short silvery white hairs, which are closely applied to the skin: the tarsi are whitish above, silvery white on the inner side, and suffused with rufous, or pale rust colour. The hairs of the moustaches are unusually long, and of a black colour.

The above description is taken from a specimen in the Museum of the Zoological Society, which was procured in Bahia. I have before me notes made upon specimens of the same animal preserved in the Leyden Museum, from which it appears that the abdomen is sometimes white, and that the chest is tinted with rufous in some individuals, and yellowish in others.

	Zoological Society Museum.		Leyden Museum.	
	Inches.	Lines.	Inches.	Lines.
Total length, measuring along the curve of the back	14	0	13	6
Length from tip of nose to ear, about	2	7	2	6
" of ear		7		6
Width of ditto	1	0½		
Length of fore foot	1	2½	1	2
" of hind foot	2	4	2	5

The dimensions of the skull of the specimen from which my description is taken will be found, with those of other species of *Cavia*, at the end of the descriptions of the animals of this genus. This skull (Plate 4, fig. 2), is readily distinguished from that of other Cavies by its more elongated form, the greater breadth of the interorbital space, and the comparatively short zygomatic arch: this is distinctly less deep beneath the anteror angle of the eye than usual; and, indeed, its vertical diameter, at this part, is scarcely greater

than at a point somewhat behind the middle of the malar bone: here, however, it is suddenly contracted in width by a deep emargination in the upper edge, leaving a distinct post-orbital angle to the malar bone. In other Cavies the zygomatic arch is most deep beneath the anterior angle of the eye, and decreases in vertical diameter more or less gradually from that point to the hinder root of the zygoma; generally, however, an angle (either obtuse or acute) is observable on the upper edge, but this forms part of the zygomatic process of the superior maxillary bone, and in none is there any angular post-orbital projection to the malar bone, as in the present species. The molar teeth are relatively smaller than in any other species of Cavy, and so is the portion of the bony palate which lies between the molar teeth: the palate in front of the molars is remarkable for its compressed form, and the incisive opening is exceedingly narrow.

Besides the species just described—which cannot be confounded with any other member of the present genus, if attention be paid to the structure of the claws, and the texture and colouring of the fur—I am acquainted with six species of *Cavia*, all of which may be readily distinguished by characters furnished by the skull and teeth; in their colouring and proportions points of distinction likewise present themselves. To these, *perhaps*, may be added a seventh species of the group having long and pointed nails to the toes—the *Cavia Cutleri*; but notwithstanding the striking difference which the colouring of the fur of this animal presents, I strongly suspect that it is a black variety of the *Cavia Aperea*.

It is to be regretted that the authors who have described the various species of Cavies have made no mention of the structure of the skull and molar teeth—probably they had no opportunity of examining these parts—but have confined their descriptions chiefly to the colouring of the fur, which being

subject to some slight variation, I have been unable, in some cases, to convince myself of the specific identity of the animals already described with those I am about to notice, since these latter do not quite agree, in this respect, with the published descriptions.

Of the six above-mentioned species, the leading points of distinction may be thus expressed :—

A. With molar teeth very nearly agreeing with those of *Cavia rupestris*—see Pl. 4, fig. 2 *b*; and Pl. 6, figs. 1 to 8, = section CERODON.

1. General hue of the fur rich rufous-brown; incisor teeth yellow. *Cavia* A. 1 = *C. flavidens*, Brandt? (Inhabits Brazil).

2. General hue of the fur grey.

a, with yellow incisors,

* with white spot behind each ear, and a whitish mark behind the eye ... ... *C. Spixii*, Wagler. (Brazil).

** without any pale spot behind the ear, or eye ... ... *C. Boliviensis*. (Bolivia).

b, With white incisor teeth: head very short. *C. Australis*, Is. Geoff. (Patagonia).

B. With molar teeth resembling those of the Domestic Guinea-Pig—Pl. 4, fig. 4, and Pl. 6, fig. 9: incisor teeth white.

1. Prevailing hue of the fur brown-black; the hairs narrowly ringed with rufous-brown ... *Cavia* B. 1 = *C. fulgida*, Wagler? (Brazil).

2. Prevailing hue brownish—distinctly freckled with black and yellow ... ... *Cavia* B. 2 = *C. Aperea*, Auct.? (La Plata).

To which may be added—

3. Fur black (brown-black on the sides and under parts of the body); no pale annulations to the hairs .. *C. Cutleri*, Bennett. (Peru ?).

CAVIA (*Cerodon*), No. 1.

Rufous-brown Cavy.

? *Cavia flavidens*. BRANDT, Mém. de l'Acad. de Petersb. (1835), iii. Pt. 2, p. 439, Pl. 17; Mammalium Exoticorum, p. 103, Pl. 17.

? *Cavia nigricans*. WAGNER, Schreb. Säugth. Suppl. iv. p. 64.
? *Kerodon obscurus*. (LICHT.) RÜPPELL, Verz. der in dem Museum der Senckenb., p. 33.

General hue rich rufous brown; throat and abdomen pale rusty yellow; incisors yellow.

Inhabits Bahia, Brazil.

The Rufous-brown Cavy is larger than the Domestic Guinea-Pig, and has the head relatively narrower and longer: in the texture of the fur it very nearly resembles that animal. The rich brown hue of the upper parts of the body is due to the hairs being rather broadly annulated towards the point, with rich rufous-yellow, and at the point of a brown-black colour: the hidden parts of the hairs are of a pale brownish grey; the coarser hairs are almost white at the root. On the sides of the body the hairs are pointed with brown, instead of brown-black, and hence these parts are rather less dark than the back. The throat and abdomen are of a pale rusty yellow—inclining to a golden yellow; but the hairs on these parts are greyish at the root: the legs and feet are of the same colour as the sides of the body. Behind each ear is a pale rufous patch; the ears are sparingly clothed with yellowish hairs, and on the cheeks is an indistinct dusky mark, running towards the ear from under the eye.

	Inches.	Lines.
Total length, measuring along the curve of the back	12	0
From nose to ear, about	2	4
Height of ear		6
Greatest width of ditto		11
Length of fore foot, including the nails ...	1	1½
" of hind foot, including the nails ...	2	2
" of nail of middle toe		3½

The skull of this animal (Plate 6, fig. 10), is relatively narrower than that of the *Cavia Cobaya*, and has the facial

portion more elongated; here, if the skull be divided into two equal parts, the centre will be found in a line with the small supra-orbital notch, but the length of the cerebral portion of the skull in *C. Cobaya* (measuring from the same point) considerably exceeds the facial portion. The ant-orbital opening is more extended, in the direction of the zygoma, and its outer angle is consequently more remote from the intermaxillary suture — 10¾ lines in the Rufous-brown Cavy, and 8½ lines in the Guinea-Pig. The lachrymal bone is interposed between the upper and lower processes of the superior maxillary, which, unlike those in the *C. Cobaya,* do not meet to form the outer boundary of the ant-orbtial opening. Upon viewing the under surface of the skull, the most striking points of distinction between the two animals consist in the narrowness of the molar teeth of the Rufous Cavy, and the greater size of the palatine bone; in *C Cobaya* the post-palatal emargination contracts the palatine bone, so that no horizontal portion remains opposite the hinder part of the posterior molar teeth, whilst in the Rufous Cavy, the lateral branches of the same bone, which here continue the plane of the palate, are fully $\frac{1}{12}$th of an inch in width. The teeth of this animal, when compared with those of *Cavia rupestris,* present scarcely any points of distinction worthy of notice: the incisors are rather broader, the hinder lobe of the last upper molar is rather more elongated, and the indenting fold on the inner side of the molars of the lower jaw is deeper. See Plate 6, fig. 2, which represents the first and second molar teeth of the lower jaw, magnified.

A Cavy in the Leyden Museum, there regarded as the *Cavia Aperea,* I feel little doubt is identical with the animal just described, though its dimensions are somewhat less. Its general hue, according to my notes, is rich brown, the fur on the upper parts of the body being pencilled with black and rusty yellow. The hairs on the back are brownish grey at

the root, black at the point, and with a subterminal rusty-yellow ring; the throat and abdomen are pale rusty yellow; the feet dark brown; the ears clothed with bright rust coloured hairs, both internally and externally, but somewhat dusky on the fore part of the outer surface. Incisor teeth yellow.

	Inches.	Lines.
Total length	10	6
From nose to ear	2	0
Height of ear, about		4½
Length of tarsus, including the nails	2	2

A skull in the same collection, which is likewise labelled as that of the *Cavia Aperea*, most closely agrees (judging from my description) with the skull of my *Cavia*, A. 1. Elsewhere, it appears that the animal under consideration is regarded as the *Cavia Aperea;* erroneously, as I think, since the British Museum has received a skeleton, *evidently* of my Rufous-brown Cavy, and which was labelled "*Cavia Aperea*."

Cavia flavidens. Brandt.

Incisors yellow; upper parts of the body of mixed brownish yellow and palish brown colours, the prevailing hue inclining to yellow; upper surface of the head, back of the neck, and an oblong patch, extending from beneath the eye to the neck, dusky; throat and abdomen yellowish white.

Inhabits Brazil.

The *C. flavidens* is said to exceed the *C. Aperea* in size, and to have a shorter head and shorter ears than that animal; the fur is likewise described as being somewhat shorter: the hairs on the back, pale brownish grey at the root, pale brownish yellow in the middle, and brown-black at the point; the hairs

on the abdomen, pale brownish grey at the root, and white, slightly suffused with yellow, externally: a small white spot on the throat, formed by a whirl of short white hairs[1].

	Inches.	Lines.
Total length	10	0
From nose to ear	2	0
From ditto to eye	1	1

Cavia nigricans. WAGNER.

Fur somewhat glossy; general hue dark brown; abdomen and mesial line of the throat of a dirty yellow colour: the hairs on the upper parts of the animal, blackish brown at the point, paler at the root, and with a narrow rusty red, or rusty yellow, subterminal ring—or, some few of them, with the exposed ends entirely dark: nails long, curved, and pointed, and projecting considerably beyond the fleshy portion of the toes. Length, 12 inches; hind foot and nails, 2″ 2‴.

Inhabits Brazil.

The general colouring of this animal is evidently darker than that of my *Cavia* (*Cerodon*) No. 1, and I should have been led, on this account, to associate it with my Cavia B. 1, but from its size, combined with the facts that the same animal

[1] In the carefully executed figure which accompanies M. Brandt's paper, the *C. flavidens* is represented as of a rufous-brown colour, tolerably dark on the upper parts of the head and body, and paler, and inclining to yellow, on the flanks; and, in fact, this figure closely resembles the animal I have described under the name of the Rufous-brown Cavy. The shortness of the head of *Cavia flavidens* would no doubt distinguish M. Brandt's animal from my Cavia A. 1, but in skins or stuffed specimens the measurement of this part, we know, is not always to be depended upon. I have described the head of the Rufous-brown Cavy as longer than that of the *C. Aperea*, not because it is longer in the stuffed specimen, but because the *skull* is longer. The small whirl of white hairs on the throat, somewhat dwelt upon as one of the characteristics of the *C. flavidens*, I have sought for in my Cavia A. 1, but, unfortunately, the skin is in part destitute of hairs on the mesial line of the throat in the only specimen I have had an opportunity of examining; I may observe, however, that a similar whirl occurs in some other species of Cavies.

is placed in the genus *Cerodon* by Lichtenstein and Rüppell (being by the former naturalist named *Kerodon obscurus*), and that Dr. Wagner states that, according to the structure of its skull, it should be arranged with the Cerodons, I am led to believe it will prove to be a variety of the Cavia described by me under the name of Rufous-brown Cavy.

CAVIA (*Cerodon*) SPIXII.

Spix's Cavy.

Cavia Spixii. WAGLER, in Isis, 1831, p. 512.
" " BRANDT, Mammalium Exoticorum Novorum, &c. p. 106.
" " WAGNER, Schreb. Säugth. Suppl. iv. p. 62, Pl. 173 A, fig. 2.

Incisor teeth yellow: general colour of the animal grey, with a somewhat indistinct brownish tint on the back; the space between the eye and the ear whitish, a white patch behind each ear, and the throat and abdomen likewise white.

Inhabits Brazil, Rio de Janeiro, Bahia, and the neighbourhood of the Amazon.

The yellow colour of the incisor teeth, and the general grey hue of the fur, combined with a distinct white patch behind, and a second in front of each ear, are the leading characteristics of this species.

A Cavy in the Zoological Society's Museum agrees so perfectly with the published descriptions of *Cavia Spixii*, that I shall proceed to describe it under this head. It is somewhat larger than the Common Guinea-Pig, and its fur is shorter and rather softer. The hairs of the fur, on the upper parts of the body, are of a very pale grey hue at the root, dusky at the point, and have a moderately broad subterminal ring of pale brownish yellow; the admixture of the darker and lighter colours producing a general brown-grey tint—by

no means dark; on the sides of the body, the hairs being less dark at the point, and the subterminal ring almost white (scarcely tinted with yellow), the general tint may be described as ashy grey: the throat, abdomen, and inner surface of the limbs are white, and the white of the under parts extends somewhat on to the sides of the body. Immediately above the eye is a narrow white mark; a less pure white band runs from the eye to the ear, and there is a somewhat conspicuous white patch behind each ear. The feet are nearly white; the fore feet rather shorter than usual, as well as the nails of the toes of these feet.

	Inches.	Lines.
Total length	11	6
From nose to ear	2	3
Length of ear		6
Width of ditto	1	1
Length of hind foot, and nails	2	1

The skull of *Cavia Spixii* (Pl. 6, fig. 11) is smaller than that of *C. Cobaya;* viewing this skull from the side, the outline of its upper surface does not become straight, or slightly concave, between the orbits, as in many Cavies, but forms a gentle, convex curve from the tip of the nasal bones to the hinder part of the parietals, where it descends somewhat suddenly towards the occiput: the nasal bones are distinctly longer than in *C. Cobaya;* the auditory bullæ larger, and these, encroaching upon the body of the basi-occipital bone, contract it in front, so that it is very narrow at that part as compared with the Guinea-Pig's skull; the auditory bullæ, moreover, encroach rather more on the occipital surface of the skull: the lachrymal bone is interposed between the superior and inferior zygomatic processes of the superior maxillary bone, as in *C. rupestris,* and some other species of the genus. The palatine bone is larger than in *C. Cobaya,* broader opposite the last molar tooth, and horizontal at this part as

in *C. Boliviensis*: the incisor teeth bend more suddenly downwards than in *C. Cobaya*; the thin plate of bone which extends between the condyloid process and the coronoid of the lower jaw is scarcely emarginated above, forming at this part almost a straight line. The molar teeth are much smaller than in *C. Cobaya*. Fig. 3, of Plate 6, represents the second molar of the upper jaw; and fig. 4 represents the two foremost molars of the lower jaw.

CAVIA BOLIVIENSIS.

Bolivian Cavy.

? *Galea musteloïdes*. Meyen, Act. Acad. Nat. Cur. xvi. Part 2, p. 598. 1833.

Incisor teeth of an orange yellow colour; general hue of the fur grey, with a very faint yellow tinge; throat and abdomen white; feet whitish.

Inhabits Bolivia, occurring only at great elevations.

This little Cavy so greatly resembles the *Cavia australis* of Patagonia, that for some time I mistook it for that animal; having, however, recently had an opportunity of examining the skulls removed from several specimens of the Bolivian Cavy, I found well-marked distinguishing characters in that part, and hence was led to make a careful comparison of the external parts of the two animals. In the colouring there is very little difference; the general hue of the *C. Boliviensis* is rather darker, and more brown on the upper parts of the body; in the proportions of the head and feet there exist more important points of distinction, the feet being proportionately shorter, and the head longer in the Bolivian animal than in the Patagonian species; I may likewise

the inter-orbital space is rather narrower; the nasal bones are narrower: the hinder part of the zygomatic arch is thrown more boldly outwards; and a distinct post-orbital process, terminating in an acute angle, projects from the zygomatic process of the superior maxillary bone. I find the grinding surface of the molar teeth, in all the skulls of the *C. Boliviensis*, very little raised above the plane of the palate, as in *Cavia Aperea*, but in the *C. Spixii*, the molars, as in *C. rupestris*, have their crowns raised much above the level of the palate: the molar teeth in *C. Boliviensis* are relatively larger than in *C. Spixii;* those of the upper jaw have two small, but distinct, indenting folds of enamel near the middle of the outer surface, whilst in *C. Spixii* there is but one distinct indentation, though it has a very slight tendency to divide; here the hinder lobe of the last molar is equal in size to the anterior one, whilst in the Bolivian animal the hinder lobe of this tooth is the larger. Lastly, I may notice a conspicuous difference in the palatal portion of the skull of these two animals, which, from the similarity of their colouring, might perhaps be confounded. In *C. Boliviensis*, the portion of the palate which lies between the molar teeth is nearly flat, whilst in the *C. Spixii* it is strongly concave, especially in the fore part; here the palatine bone occupies nearly the whole of the space between the molar teeth; the palatine portion of the superior maxillary bone forms a small raised platform between the anterior pair of molars, and then runs back from that part, in the form of a very narrow ridge, on either side, to form the socket for the molars. The palatine bone in *C. Spixii,* on the other hand, has a very small diameter in the longitudinal direction, and if measured in the mesial line; but its lateral branches are more expanded than in *C. Spixii,* and the post-palatal emargination is consequently narrower than in the skull of the animal last mentioned.

Mr. Bridges, who brought many specimens of the present species from Bolivia, procured them on the high table land between Cochabamba and La Paz, but that gentleman informs me it is found throughout the higher portions of the country, usually at elevations of from ten to twelve thousand feet.

Galea musteloïdes. MEYEN.

Meyen informs us that the lofty plains on the Pass of Tacna, to the lake of Titicaca, as well as those of Tajori (on the Andes, 18° S. Lat.), are inhabited by immense numbers of a small animal, which burrows, and so undermines the ground, that every step of the horse is attended with danger. The animal is so shy that he was unable to procure a specimen; and, indeed, it was only seen from a distance. It is described as having a long and slender body, of a brownish red colour on the upper parts, and pale on the under. Its length, without including the tail, appeared to be about eight inches. To this animal Meyen gives the name *Galea musteloïdes*.

The characters of the genus *Galea* are derived from a skull found by Meyen at the entrance of one of the burrows of the little animals just referred to, and, judging from Meyen's figures and description[1], I feel no doubt it belongs to the Rodent I have named *Cavia Boliviensis;* but, if this be the case, it cannot be the skull of the rufous-brown, burrowing animal, as Meyen conjectured; an animal which, it appears, had a tail, and which I feel little doubt is a species of *Ctenomys;* and, moreover, I think it is probably identical in species with a *Ctenomys* found by Mr. Bridges in the same district as the *Cavia Boliviensis*, a district, it will be observed, which is not far distant from Tacna and Tijori, the habitats of the *Galea musteloïdes*.

[1] Nova Acta Nat. Cur., xvi. Pt. 1. p. 597, Pl. 42, figs. 4—7, and fig. 12.

CAVIA (*Cerodon*) AUSTRALIS.

The Southern Cavy.

(*Plate* 3, fig. 2).

Cavia australis. Is. Geoff., in Guerin's Magazin de Zoologie, 3me Année, Classe 1, Pl 12. 1833.

" " D'Orbigny, Voyage dans l'Amerique, 79me livr. Pl. 18, *figs.* 1—4.

Kerodon Kingii. Bennett, Proceedings of the Zoological Society for December, 1835, Pt. 3, p. 190.

" " Waterh., Zoology of the Voy. of H.M.S. Beagle—Mammalia, p. 88.

" " Gray, List of the Mammalia in the Brit. Mus. 1843, p. 126.

Incisor teeth white; head short; tarsi long; fur rather soft, its general hue grey—by no means dark; the eye edged with white; a whitish spot behind each ear; the chin and edge of the lower jaw likewise white.

Inhabits Patagonia, from about the 39th parallel of latitude down to the Strait of Magalhaen.

This little grey Cavy, according to Mr. Darwin, is common along the coast of Patagonia, from the Rio Negro to the Strait of Magalhaen. It is very tame, commonly feeds by day, and is said to bring forth two young at a birth. At the Rio Negro it frequents, in great numbers, the bottoms of old hedges, and at Port Desire it takes up its abode amongst the ruins of the old Spanish buildings. M. D'Orbigny observed the Southern Cavy as far north as 39° S. Lat., which it appears is its extreme range in that direction; and this author states that it lives in families, and digs deep burrows in the ground, preferring sandy declivities which are more or less overgrown with bushes: its burrows are said to have several outlets.

The food of the Southern Cavy consists of seeds and green herbage, and it has been observed to ascend trees to feed upon their fruits.

The *Cavia australis* is smaller than the Common Guinea-Pig, and distinguished from others of its group by its very short head: the ears are rather smaller than usual, and the tarsi somewhat longer, in proportion to the bulk of the animal, than in most other Cavies; they are likewise narrower than usual in the group, and the hairs which cover them encroach somewhat on the under surface, so as to contract the naked sole in the middle. Its fur is shorter, and less harsh, than in the *Cavia Aperea*, and, indeed, is somewhat soft. The general hue of the upper and under parts of the body is almost uniformly grey; the abdomen being very little paler than other parts; here the hairs are of a darker grey at the root than externally; and, on the back, the hairs are grey-brown at the root, rather broadly annulated with very pale-brownish yellow towards the point, and dusky grey at the point: on the sides of the body the pale annulations of the hairs are brownish white. The chin is white, and so is the edge of the lower jaw; the eyes are edged with white, both above and below, and there is a small dirty white patch behind each ear. The nails of the toes are tolerably long, and pointed, more especially those of the hind feet.

	Inches.	Lines.
Total length	9	6
From nose to ear, about	1	8
Height of ear		4
Width of ditto		7
Length of fore foot and nails		10
" of hind foot and nails	1	11

The skull of the *Cavia australis* (Plate 6, fig. 13) is remarkable for its short and rounded form, and for the nasal bones being distinctly broader behind than in front. The

upper surface of the skull is strongly arched; the orbits very large, the ant-orbital opening less oblique in its direction than in other Cavies: here the upper boundary of the bony ring which encloses this opening is more remote from the tip of the muzzle than the lower boundary, whilst in other Cavies the upper portion of the ring projects over the lower. The auditory bullæ are larger than usual, and they encroach upon, and contract, the occipital bones more than in any other species of Cavy[1]. The incisive opening is proportionately larger, here assumes a triangular form, and is about 1¾ lines in width behind. The palate is strongly indented between the molar teeth, as in *C. Spixii*, but in *C. australis* the palatine bone forms a very small portion of the surface of the palate, being composed of two narrow branches widely separated behind, and where they meet in front they are but little produced in the antero-posterior direction. The anterior portion of the bony ring which encloses the ant-orbital opening (as in *C. rupestris* and *C. Aperea*) is entirely formed of the superior maxillary bone, and is not broken through by the lachrymal, as in *Cavia Boliviensis*, *C. Spixii*, and *C.* A 1. Immediately below the lachrymal bone, the ring in question is remarkable for its slenderness. The posterior upper molar tooth has the terminal lobe relatively wider than in other Cerodons. The incisor teeth are very narrow.

[1] The *Cavia Spixii* approaches the *C. australis* most nearly in this respect: in the *Cavia Aperea*, and the *C.* A 1, the bulla in question presents less of its surface when the skull is viewed from behind; and in the *Cavia rupestris* the tympanic bullæ form no part of the occipital surface of the cranium.

	Cavia rupestris. Zoological Society.		*Cavia (Cerodon),* No. 1. British Museum.		*Cavia (Cerodon),* No. 1. Zoological Society		*Cavia Spixii.* Zoological Society.		*Cavia Boliviensis.*		*Cavia Boliviensis.*		*Cavia australis.*		*Cavia australis.*	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Total length of skull	2	11	2	9½	2	7½	2	3	2	1	2	1	1	10	1	9⅔
Width	1	5	1	5½	1	4¼	1	3	1	2¾	1	3	1	2	1	1½
" between orbits		9½		7¼		7¼		6		5½		5⅓		5		5¼
Length of nasal bones		11¾	1	1½	1	0		10⅓		8¼		9		7		7¼
Width of ditto behind		4¼		3¼		3⅔		3⅓		2¼		3⅓		3⅛		3⅛
" " in front		5		4¾		4¼		4⅙		3¼		3½		2⅝		2¼
From incisors to molar teeth		11		9⅔		8¼		7		6⅔		6¾		5½		5
Length of four upper molars, taken together ...		6¾		7		6⅝		5¾		5½		6		5¼		5
Width of lateral branch of palatine bone, opposite the last molar tooth		1		1⅛		1⅙		0⅝		1 4/6		1¼		0⅓		0⅓
" of post-palatal emargination		3		3		2⅔		2½		1 4/6		1⅔		2¼		2¼
From outer angle of ant-orbital opening to inter-maxillary		10¾		11		10¾		9		8¼		8		6½		6¼
Length of zygomatic arch	1	1½	1	2½	1	1¼	1	0¼	1	0		11		10⅓		10
From lower edge of lachrymal bone to lower edge of zygoma		4⅔		5½		4⅝		4½		4¼		4¼		3½		4¼
Length of lower jaw			2	0	1	11	1	6¾	1	7¼	1	8½	1	5¼	1	4
Height of ditto from condyle		8¾		9		8¼		7		6¾		6¼		6		5⅓
Length of angular portion		9½		11½		10		8½		8½		9		7¾		7¼

Section 2. *Cavia proper.*

Caviæ with the hinder lobe of each of the molar teeth larger than the front one: the hinder lobe of the upper molars with a tolerably deep, indenting fold of enamel on the outer side, and the corresponding half of the lower molar with a deep fold of enamel on the inner side.

The difference in the structure of the molar teeth, as I have before remarked, I regard as of very minor importance—it is only one of degree; and yet, if attended to, will be found useful in determining the species. Here the molars are broader than in the Cerodons—a distinction, however, which is rather less marked, if the species of the present section be compared with the *C. Boliviensis*; but I would more particularly direct attention to the modification of the structure observable in the lower molars of the species of *Cavia proper*. Upon referring to fig. 9 of Pl. 6, it will be seen that the fold of enamel (*a*) which penetrates the hinder lobe of these teeth, runs in from the middle of the lobe, and, sloping obliquely forwards, meets the deep fold of the outer surface of the tooth, and encloses the small area, marked *. No such area is visible in the tooth of a *Cerodon*. In having the molar teeth more approximated to the hinder root of the zygoma, and the crowns of these teeth descending but little below the level of the glenoid cavity, the *Cavia Aperea* (which may be regarded as the type of the present section) carries to an extreme a characteristic feature of the Cavy group. In the *Cavia rupestris* the molars are considerably more remote from the hinder root of the zygoma, but here, as in nearly all the other members of the sub-family *Caviina*, the dental portion of the superior maxillary bone is carried so far back that it touches the temporal bone[1].

[1] The only exception I am acquainted with is the *Cavia Patachonica*; in the skull of which animal, an extremely narrow strip of the palatine bone

CAVIA APEREA.

Restless Cavy, or Guinea-Pig.

Wild.

? *Aperea Braziliensibus.*	MARCGRAVE, Historiæ Rerum Naturalium Brasiliæ, p. 244 (1648).
? *Cavia Aperea.*	LINN., Syst. Nat. ed. Gmel. i. p. 122.
? " "	KUHL, Beiträge zur Zoologie, p. 65.
" "	F. CUVIER et GEOFFR., Hist. Nat. des Mammif. fasc. 48.
? " "	PR. MAXIMILIAN, Abbild. zur Naturgesch. Bras.; Beiträge zur Nat. Bras. ii. p. 462.
" "	RENGGER, Naturgesch. der Säugethiere von Paraguay, p. 274.
" "	WAGNER, Shreb. Säugth. Suppl. iv. p. 58, Pl. 173 A, fig. 3.

Domesticated.

Cavia Cobaya.	MARCGR. Bras. p. 224.
" "	SCHREB., Säugth. iv. p. 617, Pl. 173.
" "	DESMAREST, Mammalogie, p. 356.
" "	(Guinea-Pig). JENYNS, Manual of British Vertebrate Animals, p. 36.
" "	(Restless Cavy). BELL, British Quadrupeds, p. 353.
" "	(Meerschweinchen). WAGNER, Schreb. Säugth. Suppl. iv. p. 65.
Mus Porcellus.	LINN., Syst. Nat. 12th ed., i. p. 79.
Variegated Cavy.	SHAW, General Zoology, ii. p. 17, Pl. 126.
Cochon d'Inde.	BUFFON, Hist. Nat. viii. p. 1, Pl. 1.

Wild Guinea-Pig. Incisors white : fur long, and somewhat coarse ; on the upper parts and sides of the body distinctly pencilled with black and dirty yellow ; chest grey-brown ; throat and abdomen pale dirty yellow, or, sometimes, brown-grey.

Inhabits the banks of the Rio Plata, and extends northwards into Paraguay, Bolivia, and Brazil.

separates the superior maxillary bone behind, from the temporal bone. In other Rodents we find the two bones in question more or less widely separated by the sphenoid, and often by a portion of the palatine bone as well as the sphenoid.

I have examined specimens of this Cavy from Maldonado, La Plata, and from Bolivia; the former brought home by Mr. Darwin, and the latter collected by Mr. Bridges. According to Mr. Darwin, the animal is known by the name "Aperea," and is exceedingly common in the neighbourhood of several towns which stand on the banks of the Rio Plata; sometimes frequenting the sand hillocks, or the hedge-rows formed of the Agave and Opuntia; but marshy places, covered with aquatic plants, appear to be preferred. Where the soil is dry, it makes a burrow, but where otherwise, it lies concealed amidst the herbage. It generally comes out to feed in the evening, and if the day be gloomy, it will likewise make its appearance in the morning. In Bolivia, Mr. Bridges informs me, this animal is confined to the low lands, and in this respect differs from the *Cavia Boliviensis*, which is always found at a considerable elevation. It is not uncommon in fields, in the vicinity of Chuquisaca and Cochabamba, and takes shelter amongst the loose stones of the walls by which the fields are enclosed.

Dr. Rengger informs us that the Aperea is found throughout Paraguay, and extends southwards as far as lat. 35°; he has himself not only met with the animal (with which he is well acquainted) in those parts, but likewise in Brazil, both in Bahia and Pernambuco. In Paraguay it generally frequents moist situations, and near the borders of the forests, but it never occurs either in the forests, or in the open fields. It lives in little societies (according to the same author) of from six to fifteen individuals, in the impenetrable groves of Bromelias; and its presence is detected by the numerous little beaten paths which it forms amongst these plants. It feeds early in the morning, and after sunset in the evening, but never strays far from its home. The Aperea breeds but once in the year, and then has but one or two young.

A specimen from Maldonado, presented to the Zoological

Society by Mr. Darwin, has the fur long, and somewhat coarse; on the upper parts, and sides of the head and body, it is distinctly pencilled with black and dirty yellow, the black prevailing on the back and upper surface of the head, but, on the sides of the body, the black and yellow colours are in about equal proportions. The general tint is darkish brown, slightly inclining to grey, being totally destitute of any red hue. The throat and abdomen are of a dirty yellow colour, but very pale; here the hairs are of a very pale grey colour at the root: the hairs on the upper parts of the body are of a dusky grey colour at the root, and black, or brownish black, beyond, with the exception of a moderately broad subterminal yellow ring: some of the longest hairs are destitute of the pale ring. The hairs on the ears are for the most part of a dirty yellow colour: the feet are pencilled with yellow and dusky, and on the inner side of the wrist (as is usual in this group) there is a space which is rather sparingly clothed with minute silvery white hairs. On the back of the neck the fur is very long.

	Maldonado.		Bolivia.		La Plata?		Domestic Guinea-Pig.		Domestic Guinea-Pig.	
	Ins.	Lines.	Ins.	Lines	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length	9	0	9	9	10	0	9	6	10	9
From nose to ear ...	2	3	2	1	2	0	2	1	2	2
Height of ear, about ...		5½		6		6		8		9
Width of ditto, about .		10	1	0		11	1	1½	1	1½
Length of fore foot and nails	1	0		11		10		10	1	6
" of hind foot and nails	1	11	1	8½	1	9	1	8½	1	11

An old male, killed at Maldonado, weighed, according to Mr. Darwin, one pound three ounces.

A specimen in the British Museum collection agrees with the above description, excepting that a brown mark runs

from the chin along the middle line of the throat, and joins the broad grey-brown band which crosses the chest: it is from Bolivia. A second specimen, in the same collection, differs in having the throat and abdomen of a pale brownish grey colour, very indistinctly suffused with dirty yellow.

It has been supposed that the Aperea is the wild race from which the Cobaya, or Domestic Guinea-Pig, sprang, but observing several differences in the structure of the skull and teeth of the two animals, Dr. Rengger arrives at an opposite conclusion, and considers that his view is further supported by the facts, that the Aperea, by choice, frequents damp situations, and can bear the cold with impunity, whilst the Cobaya, or Domestic Guinea-Pig, shuns both cold and moisture; that the wild animal produces but once in the year, and then has but one or two young, whilst the Cobaya has many young at a birth, and breeds two or three times in the year: that he could not succeed in pairing tamed individuals of the Aperea with the Guinea-Pig; and, lastly, that he had observed no differences in the colouring of the Aperea, even after having been kept in confinement for several generations[1].

Amongst other points of distinction, Dr. Rengger notices that in the *C. Aperea* the facial portion of the skull is more pointed in front than in the *C. Cobaya*, and that the nasal bones, in the former animal, differ from those of the latter in being pointed behind. In two out of three skulls of the *C. Aperea*, now before me, the terminal portion of the muzzle is distinctly narrower than the same part in four skulls of the *C. Cobaya*, but in a third skull of *C. Aperea* this difference

[1] Dr. Rengger observes that he saw fourteen tame Apereas, whilst on a journey to Villa Rica (in Paraguay), at the house of a countryman, who had reared five or six generations from a single couple, which he had captured when they were very young, seven years previously. They agreed with the wild animal in their colouring and mode of life, and, as in the wild condition, the females brought forth but once in the year, and then had but one or two young.

does not exist; here, however, as in the other skulls of *C. Aperea*, the nasal portion of the muzzle appears to be more elongated, and more attenuated than in *C. Cobaya*; this arises from the slope of the ridge, above the ant-orbital opening, being more gradual than in the skulls of the *C. Cobaya*. The hinder part of the nasal bones terminates in a point in the crania of *C. Aperea*, and are more or less truncated in those of Cobaya. Another difference which may be noticed is, that there is a greater extent of the petro-tympanic bone visible above the *meatus auditorius* in the Aperea than in the Cobaya[1]. Now, in the *C. Boliviensis* I found well-marked points of distinction in the skull and teeth, separating that animal from other Cavies; but though the skulls of different specimens of this species agreed amongst each other in possessing these peculiarities, they likewise differed, and the parts which were found to vary were precisely those in which dissimilarity of structure has been observed upon comparing the skulls of the *C. Aperea* and *C. Cobaya*; with this exception, that I have perceived no difference in the petro-tympanic bone analogous to that pointed out in the crania last referred to; I have, in fact, seen but two skulls of the Bolivian Cavy in which these bones were not wanting—the skulls being imperfect. In the form of the nasal bones they present the same kind of difference as that which distinguishes the *C. Aperea* from *C. Cobaya*, being sometimes truncated, or very nearly so, and sometimes prolonged in the mesial portion, behind, even to a greater degree than in the Aperea; and the ridge in front of the supra-orbital opening

[1] Dr. Rengger alludes to a difference in the curvature of the incisors, in the relative length and breadth of the molars, and in the colour of the cement of these teeth, as well as to a difference in the direction of the plane of the occiput (if I correctly interpret his expressions); moreover, he did not find the proportionate height of the lower jaw the same in the animals under consideration. In none of these points do I find any distinction in the skulls before me.

differs fully as much, and in the same manner, as has been pointed out in the skulls of the Domestic and Wild Guinea-Pig. On the other hand, if the skulls of *C. Aperea* and *C. Cobaya* be studied with reference to those parts which are little subject to variation in individuals of the same species of the genus *Cavia*, their points of resemblance become very striking. They agree most closely in the form of the zygomatic arch, in having no distinct angular process on its upper edge, the palate slightly concave, the palatine bone small, with the lateral or pterygoid branches externally narrow, especially opposite the last molar tooth; these branches do not extend the plane of the palate in the horizontal direction, as in many other species of Cavy, but slope into the post-palatal channel. The ant-orbital opening is entirely enclosed in front by a portion of the superior maxillary bone. Then, in connection with these points of agreement in the structure of the skull, we have to add that the animals themselves agree in size and proportion, and that a third, the *C. Cutleri*, has a skull presenting all the same general resemblances, and is intermediate between the skulls of *C. Cobaya* and *C. Aperea*, in certain points in which differences have been observed; having the broad and truncated nasal bones of the former, and the less abruptly projecting upper anterior root of the zygoma, of the latter; and, lastly, I shall be able to show that the structure of the molar teeth, which, as I have already noticed, presents peculiarities linking these three animals together, may be essentially the same as in these animals, and yet combined with some well-marked differences in the structure of the skull, and in other parts. Taking all these points into consideration, I have the conviction forced upon me, that the *C. Aperea*, *C. Cobaya*, and *C. Cutleri*, do not present peculiarities of structure which can justify our regarding them as distinct species.

natives of America. I think it more probable, however, that some pretty variety[1]—some unusual condition presented by the little *C. Aperea*, so common in many parts of South America, —had attracted the attention of the earliest European settlers in the New World, and given rise to its capture and domestication, more especially as the harmless disposition and pretty colouring of the Common Guinea-Pig appear to be the only claims of interest which are attached to it, unless it really possesses the one useful property attributed to it, that of banishing the rats from its vicinity.

Cavia Cutleri. BENNETT.

General hue black, the sides and under parts of the body inclining to brown, especially the latter.

[1] Besides black or white varieties, which occasionally occur in wild animals, there is a yellowish or yellow-brown variety, which is not very rare. Amongst the Rodents, I have seen such a variety in the Beaver, the Muskwash, Mouse, in more than one species of Rat and Squirrel, in the Rabbit, and in the *Octodon Degus*. Since there are many grounds for believing in the existence of a very close affinity in the conditions which produce all such variations as those noticed in the Guinea-Pig, I can conceive it highly probable that the offspring of an animal presenting an abnormal condition in its colouring, would, if paired with one in the usual state, be subject to throw out other varieties, and, in fact, that from such a stock, variations like those presented by the Guinea-Pig, might in a short period be obtained, whilst, on the other hand, many generations might be reared from a pair in which there was no difference in colouring, without producing varieties. Whether my conjecture be well founded or not, I think that Dr. Rengger's opinion of the non-specific identity of the *C. Aperea* and *C. Cobaya*, derives very little support from that part of the argument which relates to the absence of variety in colouring in the former animal, for it is difficult to conceive that that species should be exempt from the effects of peculiar conditions which, in so many other species of animals, produce such varieties—species not confined to the class Mammalia; for it is impossible not to be struck with the great similarity which exists between the variations of colour in the domestic animal under consideration, and those of the Gold-fish, which may be summed up in the same terms, merely substituting "silver" for "white," and "golden red" for "fulvous-yellow." If certain conditions superinduce a similar change in animals so widely separated—if they operate so far in the animal scale—may they not extend to the highest?

The habitat of this animal is not known, but in Capt. King's note relating to the specimen upon which the species was founded, it is stated that the animal was known by the name of the *Peruvian Cavy.* In size and proportions it closely resembles the *C. Aperea*, but the fur differs from that of all other wild Cavies in being black, or nearly so—the hairs having no trace of a sub-terminal pale ring; on the back they are brown-grey at the root, and black externally; and those on the sides of the body are grey-brown, with a black point, and on the abdomen they are of a very deep brown.

	Inches.	Lines.
Length, about	10	0
" of ear		7
" of fore foot and nails	1	0
" of hind foot and nails	1	10

The proportions of this animal being essentially the same as those of the *C. Aperea*, and the skull presenting all the characteristics of that species, I cannot regard the colouring as furnishing good grounds for a specific distinction: in fact, I firmly believe it to be a black variety of the *C. Aperea.*

CAVIA (B. 1).

? *Cavia fulgida.* WAGLER, in Isis, for 1831, p. 512.
? " " WAGNER, Schreb. Säugth. Suppl. iv. p. 59.
? " *rufescens.* LUND. Det K. Danske, Vidensk. Selks., viii. 282.

Incisor teeth white: fur very long, and glossy; prevailing hue brown-black, obscurely and finely freckled with rich yellow-brown; abdomen brown-yellow.

Inhabits Minas Geraes, Brazil.

This is a small species—smaller than the *C. Cobaya*, and differs from other members of the genus, which have come under my notice, in being of a darker hue; the visible portions of the hairs on the upper parts of the body being black,

with the exception of a very narrow rich yellow-brown ring, at some little distance below the point; the mixture producing a brown-black hue: at the root, the hairs, on the parts just mentioned, are grey, as are also those on the abdomen, but these latter are of a brown-yellow colour at the point. There is no pale mark near the eye, nor behind the ear. The fur is glossy and long, especially that on the hinder part of the back.

	Inches.	Lines.
Length	9	0
" from nose to ear, about	1	11
" of ear		5
Width of ditto		9
Length of fore foot and nails		11
" of hind foot and nails	1	10

The skull of the specimen from which my description is taken, and which is in the Museum of the Zoological Society, is imperfect, having lost the portions behind the zygomatic arch, but the remaining parts shew it to have been equal in size to the crania of the *C. Cobaya* or *C. Aperea*, and relatively rather broader. Viewing the upper surface, the most striking difference which presents itself, when compared with the skulls of the animals just mentioned, is in the form of the zygoma; this is less arched, and the skull is more distinctly widest if measured at the hinder root of the zygomata. The nasal bones are broad, and rounded behind. The upper edge of the zygoma is produced into a distinct and acute post-orbital process, which springs from the maxillary portion, immediately above its union with the malar bone. The palatine bone is larger, and the pterygoid processes extend the plane of the palate, and are fully double the width, measuring the palatal surfaces; and the post-palatal channel on which they encroach is proportionately narrow. The molar teeth are distinctly smaller in proportion to the skull; the hinder lobe of the last molar is smaller, and the fold of enamel,

entering from the outer side of the tooth, which separates the lobe from the body, is deeper. A small longitudinal ridge of bone projects from the upper surface of the zygomatic process of the maxillary, and forms the outer boundary of a groove for the infra-orbital nerve: a similar ridge is found in the skulls of all the other species of *Cavia* I have examined, with the exception of *C. rupestris*, *C.* A. No. 1, and *C. Spixii*: it is wanting in the genera *Dolichotis* and *Hydrochœrus*.

Cavia fulgida. Wagler.

According to Dr. Wagler's description, the *C. fulgida* has the same long glossy fur and white incisor teeth as my *Cavia* B. 1, but it would appear to be of a richer colour, having the pale annulations near the points of the hairs more distinct. I feel little doubt, however, that the two animals are the same. The upper parts and sides of the animal are said to be pencilled with rusty-red, and black; on the flanks, gradually passing into the rusty-ochreous tint which covers the whole of the abdomen and inner surface of the limbs. The hairs on the back are grey at the root: some of them entirely black beyond, but the greater portion, with pale rusty points. The ears are margined with black, and on the inner surface clothed with rusty red hairs. The hairs of the moustaches are dark brown, or some of them, pale yellow. Length, nine inches and a quarter.

Dr. Wagner's description is drawn up from the same specimen as that described in the Isis by Wagler: it was procured by Spix whilst on his journey on the Amazon River. The former of these authors says that Lund's *Cavia rufescens* is unquestionably of the same species, in which statement I agree, and my *Cavia* B. 1, being from the same district as Lund's *C. rufescens*, adds further grounds for supposing it to be a mere variety of the *C. fulgida*.

	C. Aperea. Maldonado, La Plata.		*C. Aperea.* Maldonado, La Plata.		*C. Aperea.* Maldonado, La Plata?		Domestic Guinea-Pig. Female.		Domestic Guinea-Pig.		Domestic Guinea-Pig.		*Cavia leucogaster.* Leyden Museum.		*Cavia Cutleri.*		*Cavia*, B. 1.	
	Ins.	Lines	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Total length of skull	2	6	2	4¼	2	3¼	2	3⅔	2	5½	2	7½	2	6	2	7½		
Width	1	4	1	3⅓	1	2	1	3⅛	1	4¼	1	5	1	5¼	1	6	1	3¾
" between orbits		6¾		5⅔		5½		6		6		6½		6½		6¼		6
Length of nasal bones		10¼		9		9		9		9½				10¼		10¼		9
Width of ditto behind		4		3¾		3⅙		3¼		3⅔		3⅔		4¼		3¼		4
" " in front		4⅓		3⅔		3 4/6		4¼		4⅓		4½		4½		4⅓		4¼
From upper incisors to molar teeth ..		8¼		7⅔		7½		7¼		8¼		8⅓		8½		8¾		8
Length of *four upper molars*, taken *together*		7		7		6⅝		6¾		7		7		7⅔		7⅔		5¾
Width of lateral branch of palatine bone, opposite the last molar tooth ...		0⅓		0⅓		0⅓		0⅓		0⅓		0⅓				0½		0⅝
" of post-palatal emargination. ...		2⅙		2⅓				2½		3		3				2½		1¾
From outer angle of ant-orbital opening to the intermaxillary suture		8½		8¼		8		7		7⅔		8½				9		7¾
Length of zygomatic arch	1	1½	1	0¾	1	0¾	1	1⅔	1	1¼	1	2¼			1	3	1	0½
From lower *edge of lachrymal* bone *to* lower edge of zygoma		4¾		4⅔		4⅔		4¼		4¾		5				5¼		4½
Length of lower jaw	2	1	1	11½			1	10	1	10½			2	0½				
" of ditto, measuring from the hinder side of the condyle	1	7¼	1	6¾	1	6¼	1	6	1	7					1	8½	1	6
Height of ditto, from apex of condyle ..		7¼		7		7½		7¼		7¼				8		8½		6⅔
Length of angular portion		11⅓		11				10¾		9¼								

I must now notice one or two species of Cavy with which I am only acquainted from descriptions.

CAVIA LEUCOPYGA.

The White-rumped Cavy.

Cavia leucopyga. BRANDT, Mem. de l'Acad. de Petersb. (1835), iii. Pt. 2, p. 436, Pl. 16; Mammalium Exoticorum, p. 100.
" " WAGNER, Schreb. Säugth. Suppl. iv. p. 63.

Incisor teeth white: fur on the upper parts of the animal of mixed brown-black, and brownish yellow colours; throat, chest, and abdomen, white.

Inhabits Brazil.

The *C. leucopyga* is said to be equal in size to the *C. rupestris,* and therefore superior to the *C. Aperea*; its head is more elongated, and somewhat more convex, and the ears rather smaller, than in the latter animal. The hairs of the fur harsh (rather more so than in *C. Aperea*); those on the upper parts of the body of an ashy grey colour at the root, brownish black in the middle, black at the point, and with a subterminal ring of palish yellow, or inclining to white, with a faint brownish yellow tint: some of the hairs, however, want this pale ring. On the throat and under parts of the body the hairs are likewise greyish at the root, but their exposed portions are white, or yellowish white. The claws are shorter and of a less dark colour than in *C. Aperea.*

	Inches.	Lines.
Total length	11	0
From nose to ear	2	6
From ditto to the angle of the eye	1	3

To the above, which is extracted from Brandt's very detailed description, I may add, that in the figure which accompanies the account, the animal is represented as of a grey colour on the upper parts of the body, and that the figure greatly resembles the species I have described under the name of *Spixii*, from which it, however, may be distinguished by its incisor teeth being white, and by the absence of any white spot either behind the ear or the eye. The structure of the skull and molar teeth is not alluded to.

Cavia Cutleri. TSCHUDI.

Cavia Cutleri. TSCHUDI, Fauna Peruana, Part 5, p. 195 (1845).

Upper parts of the body blackish brown, pencilled with clay-yellow; each hair from the root to the middle blackish brown, with a broad whitish yellow ring, and a blackish point: muzzle, and the region immediately in front of the eye, somewhat brighter than other parts: outer surface of the ear thinly clothed with short blackish hairs, the inner surface with longer yellowish hairs: sides of the body of a brighter hue than the upper parts: throat, breast, and abdomen, as well as the inner surface of the limbs, of a bright clay-yellow, which colour is very rich (particularly in young individuals): feet somewhat darker, the soles blackish grey, and the nails black. Total length of the animal from 12 to 13 inches.

Inhabits Peru, on the western side of the Andes, in the neighbourhood of the town of Ica, South Lat. 14° 15'.

Dr. Tschudi, who was acquainted with but one wild species of Cavy in Peru, concludes that species to be identical with the animal described by Mr. Bennett (see p. 191 of this work), which is supposed (certainly not upon very satisfactory grounds) to be a native of Peru: the much larger size of Dr. Tschudi's animal, however, renders it highly probable that it is a dis-

tinct species. The difference in the colouring I think less important, for, as I have before stated, I strongly suspect the *C. Cutleri* of Mr. Bennett to be an accidental variety—in fact, a case of melanism. Dr. Tschudi states, with regard to the present species, that it is found in extraordinary numbers near the hedges and walls in the vicinity of the town of Ica, and that it makes its appearance early in the morning; and, in the evening, after sunset.

Dr. Lund, in his papers upon the Fossil Mammalian Remains found in the Caverns of Brazil, published in the Transactions of the Royal Danish Society[1], enumerates three recent species as occurring in the district of Minas Geraes, viz., *C. Aperea*, *C. rufescens*, and *C. saxatilis*; and four fossil species—*C. Apereoides*, *C. gracilis*, *Cavia* allied to *C. saxatilis*, and *C. bilobidens*. The characters of some of these are briefly noticed, and illustrated by figures representing the structure of the teeth.

Cavia saxatilis. LUND.

Judging from the figure of the last upper molar tooth (Pl. 25, fig. 18, in the 8th volume of the work quoted), I strongly suspect this animal will prove to be the same as my *Cavia* A. 1.

Cavia rufescens. LUND.

Said to be smaller than the *C. Aperea*; of a reddish colour above, with a yellow-grey abdomen, and white incisor teeth.

The last upper molar tooth, figured by Dr. Lund (Pl. 25, fig. 15), corresponds most closely with the same tooth in my

[1] Det Kongelige Danske Videnskabernes Selskabs Naturvidenskabelige og Mathematiske Afhandlinger.

Cavia B. 1: the indentation on the outer surface of that tooth, and which separates the small third lobe from the body of the tooth, as in my *Cavia* B. 1, is deeper and narrower than in *C. Aperea.* The colouring of Dr. Lund's animal would appear to be paler and brighter than in the specimen described in this work, and to which I have just referred.

Of the fossil species, the

Cavia bilobidens, LUND,

is evidently nearly allied to the *C. Boliviensis.* The molar teeth represented in Dr. Lund's Plate 21, fig. 6, and Pl. 25, fig. 17, agree very nearly with the corresponding teeth in the Bolivian animal: as in that species, the second lobe of the last upper molar has a distinctly greater transverse diameter than the first lobe; the third lobe of this tooth, however, is decidedly longer and narrower in the recent species than in the fossil.

Cavia Apereoides. LUND.

Whilst, according to my views, the preceding species would belong to the Cerodon section, the hinder molar tooth of *C. Apereoides* (Pl. 25, fig. 16, of the Danish Transactions) presents the essential structure of the typical Cavies, and, like the species of that section, it has the interspace between the lobes of the teeth filled with cement, there being little or no cement between the lobes of the molars in the Cerodons. Compared with the corresponding tooth in *C. Aperea,* this fossil tooth differs in having the front lobe relatively larger in the antero-posterior direction; the hindermost lobe longer, separated by a distinct notch on the inner side of the tooth, and with the apex curved somewhat inwards.

Genus, *Hydrochœrus*[1].

Hydrochœrus. Brisson, Regnum Animale, p. 117 (1756).

Caviæ with the upper incisor teeth having a broad and shallow groove in front; the molars unequal in size; the three foremost of the upper jaw, each with two principal lobes, and the last, which is much larger than the rest, with many narrow transverse lobes (see Pl. 4, fig. 3 *b*): the two foremost molars of the lower jaw, each with three principal lobes; the third and fourth, each with four lobes, of which two, forming the middle part of the tooth, are simple, narrow, and transverse; the hindermost molar exceeding either of the three preceding teeth in size (see Pl. 4, fig. 3 *c*): feet short and broad, and semi-palmated; the toes terminating in broad and depressed nails: ears small.

HYDROCHŒRUS CAPYBARA.

The Capybara.

(*Plate* 5, fig. 2.)

Hydrochœrus Capybara.	Erxleben, Systema Regni Animalis, p. 193.
" "	Desm., Mamm. Part 2, p. 355.
" "	Cuvier, Règne Animal, ed. 1829, vol. i. p. 220.
" "	Pr. von Nieuw., Beitrage, ii. p. 475.
" "	Rengger, Naturgesch. der Säugth. von Paraguay, p. 268.
" "	Darwin, Voy. of H.M.S. Beagle — Mammalia, p. 91.
Cavia Capybara.	Schreb., Säugth. iv. p. 620, Pl. 174.
Sus hydrochœrus.	Linn., Syst. Nat., 12th ed. i. p. 103.
Cabiai	Buffon, Hist. Nat., xii. p. 348, Pl. 49—50.

Head large, the muzzle obtuse; eyes small; ears likewise small, emarginated behind; body very stout, and clothed, rather scantily, with long and coarse hairs, of a rufous-brown colour on the upper parts of the animal, and dirty brownish yellow on the under parts.

[1] From ὕδωρ, water; and χοῖρος, a hog.

Inhabits the eastern portions of South America, from Guayana in the North, down to the Rio de la Plata in the South, and extends westwards into the lowlands of Peru and Bolivia.

As, in the class Mammalia, the largest known species are aquatic, so, in the minor divisions of the class, we find, *as a general rule*, the largest species have aquatic habits. Few species of the order Rodentia attain a size approaching to that of the Beaver or Coypu, whilst in the Capybara we have presented to us by far the largest species of the group—a gigantic Water Cavy; its stout body, scantily clothed with long and coarse hairs, gives to it a certain resemblance to the Pigs, with which, indeed, it has been arranged. Its head is large, remarkably flat on the upper surface, the muzzle broad and obtuse, the upper lip slightly notched above the incisor teeth, the eye small, placed considerably nearer to the ear than to the end of the nose, and protected above by distinct eye-lashes; the ears relatively small, rounded above, and emarginated behind; the limbs short and stout; the feet short, broad, and naked beneath; the toes joined by a web, which, however, does not extend to their extremities, the toe-nails short, broad, depressed, and by no means acutely pointed. A small horny protuberance represents the tail, and, according to Dr. Rengger, there is a small naked spot immediately beneath the nose in the male sex, which does not exist in the female[1]. The hairs covering the body are coarse and long (five or six inches in length on the hinder part fo the back in a large specimen in the British Museum), and are not sufficiently abundant completely to hide the skin. The colouring varies very little; in the large specimen just referred to, the hairs on the upper parts, and sides of the body, are of a rufous-brown colour, by no means dark; on the back many of the hairs are dusky at the point, and on the hinder parts they assume a rusty hue; the hairs on the under

[1] A specimen now living in the Menagerie of the Zoological Society has a large oil-secreting gland on the upper surface of the muzzle.

parts are of a pale dirty brownish yellow hue The hairs of the moustaches are dusky.

A second, and much smaller specimen, in the same collection, differs only in having the upper parts of the body more distinctly pencilled with dusky.

	Inches.	Lines.	Inches.	Lines.
Total length	51	0	44	0
From nose to ear	9	0	10	0
Length of ear	2	0	2	6
Width of ear	2	0	1	6
Length of fore foot and nails ...	5	9		
The nail of the middle toe		6		
Its width		7		
Length of hind foot and nails	9	0		
" of nail of middle toe ...	1	3		
Width of ditto	1	1		
Medium height	20	0	18	6

The dimensions in the first column are from a remarkably large specimen in the British Museum; those in the second column are furnished by Dr. Rengger, and are said to be from a fine male specimen. Residing in Paraguay for a considerable time, where the Capybara is common, Dr. Rengger no doubt took his dimensions from a recent specimen[1].

The skull of the Capybara (Plate 4, fig. 3) is remarkable for the flatness of its upper surface; the outline of this part, viewed from the side, presents very nearly a straight line from the tip of the nasal bones to the middle of the parietal bones, from which latter point it descends slightly to the occiput. The nasal bones are very broad, flat behind, and convex, in the transverse direction, on the fore part; their diameter is nearly the same at each extremity. The zygomatic arch is very deep, and differs from the corresponding part in the skulls of other Cavies, in presenting but little difference in the vertical diameter, when measured in front, beneath the orbit,

[1] The difference in the relative proportions of width and length in the ear perhaps arises from Dr. Rengger's having taken the width of the ear in a straight line, whereas my dimension gives the width as measured on the outer surface, and taking the curve.

or behind. A small, obtusely pointed, post-orbital process, rises from the malar bone: the lachrymal bone is large, and remarkable for the large and pointed process which projects outwards from its posterior upper angle. But, viewing the side of the skull, the most striking peculiarity is the enormous size of the mastoid process which is thrown downwards from the occipital bone. The auditory bullæ are proportionately smaller than in other Cavies. With regard to the palatine portion of the cranium, as that is represented on the plate, I will only call attention to the increased size of the palatine bone, as compared with that of other *Caviina*: here, this bone is much less deeply emarginated behind than usual. The lower jaw is represented (fig. 3 *a*), as viewed from the outer side: the horizontal protuberance on this part, although very prominent, is but slightly concave on the upper surface towards the fore part, and again towards the hinder part. The incisor teeth, which are white, are rather broader than deep, and have a broad and shallow channel on the anterior surface; those of the under jaw as well as those of the upper. The molar teeth, the grinding surfaces of which are represented in figs. 3 *b*, and 3 *c*, are remarkable for the large proportion of cement which enters into their composition, and the Capybara present a rare exception, amongst Rodents, in having the body of these teeth, in parts, completely traversed by the plates of enamel: in other Rodents the enamel almost always enters into the body of the tooth in the shape of folds or loops, but in the Capybara each tooth consists of two or more parts, composed of dentine enclosed in enamel, and these separate parts are united by the cement. The three foremost molars of the upper jaw (fig. 3 *b*) are each composed of two lobes separated by the cement, and each lobe has a deeply indenting fold of enamel on the outer side. The last upper molar has nine or ten simple, narrow plates, placed transversely, and joined to each other, and to an anterior, and

posterior lobe, by layers of cement of corresponding width; the anterior lobe of the tooth resembles one of the lobes of the preceding molars, terminating in an acute angle on the inner side, and broad, and divided by a deeply indenting fold of enamel externally: the hinder lobe is composed of two transverse plates, which are joined on the outer surface of the tooth. In the tooth figured there are nine of the intermediate simple plates, which so strongly remind us of the plates of which the Elephant's tooth is composed, and which are united in a similar manner by cement; but in the skull of a young animal there exist ten of the simple plates in the hinder molar. In this same skull I found certain points in which the molars of the lower jaw do not agree with those represented in my plate (fig. 3 *c*); for instance, in the young skull the hindermost plates of the last molar are united on the inner side of the tooth, and the two foremost are joined on the outer side, and in the front molar the enamel is continuous, entering and returning on either side of the tooth without interruption. The teeth figured are those of an aged animal, and the differences just noticed arise from the circumstance that some portions of the outer surface of the teeth have been broken off.

The dimensions of the skull of the large animal from which my description is taken, are as follows:—

	Inches.	Lines.
Total length of skull	10	0
Width	5	5
" between orbits	2	9
Length of nasal bones	3	4
Width of ditto behind	2	0½
Ditto in front	1	8½
Length of the mastoid processes	2	2
Width of space between foremost molars ...		2
Ditto between hindermost molars	1	9
" of incisors	1	0
Length of four upper molars, taken together	3	1
" of the last upper molar	1	7

	Inches.	Lines.
Greatest width of the last upper molar ...		8
Total length of lower jaw	?	
Length of lower jaw to hinder part of condyloid portion	7	1
Antero-posterior diameter of condyloid process	1	4
Length of the four molar teeth, taken together	3	5
" of the last lower molar		11
Greatest width of ditto		7½

A specimen of the Capybara shot by Mr. Darwin at Monte Video, weighed ninety-eight pounds: its length, from the end of the snout to the stump-like tail, was three feet two inches, and its girth, three feet eight. "These great Rodents," says Mr. Darwin, "are generally called 'Carpinchos:' they occasionally frequent the islands in the mouth of the Plata, where the water is quite salt, but are more abundant on the borders of fresh-water lakes and rivers. Near Maldonado three or four generally live together. In the day-time they either lie among the aquatic plants, or openly feed on the turf plain. When viewed at a distance, from their manner of walking, as well as from the colour, they resemble Pigs; but when seated on their haunches, and attentively watching any object with one eye, they reassume the appearance of their congeners, the Cavies. These animals, at Maldonado, were very tame; by cautiously walking, I approached within three yards of four old ones. This tameness may probably be accounted for by the Jaguar having been banished for some years, and by the Guacho not thinking it worth his while to hunt them. As I approached nearer and nearer, they frequently made their peculiar noise, which is a low abrupt grunt, not having much actual sound, but rather arising from the sudden expulsion of the air: the only noise I know at all like it is the first hoarse bark of a large dog. Having watched the four, from almost within arm's length (and they me) for several

minutes, they rushed into the water at full gallop, with the greatest impetuosity, and emitted at the same time their bark. After diving a short distance, they came again to the surface, but only just showed the upper parts of their heads. When the female is swimming in the water, and has young ones, they are said to sit on her back. These animals are easily killed in numbers, but their skins are of trifling value, and the meat is very indifferent. I never heard of the Carpincho being found south of the Plata, but as I see in a map that there is a Laguna del Carpincho high up the Rio Salado, I suppose such must have occurred. On the islands of Rio Parana they are exceedingly abundant, and afford the ordinary prey of the Jaguar[1]." In some parts of Paraguay they are said to be likewise very numerous, as many as twenty and more individuals being sometimes seen together. The female has from one to four young. Mr. Bridges met with the Capybara on the banks of the Mamorè, as well as in the vicinity of some other rivers of Bolivia; and, that it occurs in the rivers in the lowlands of Peru, we learn from Dr. Tschudi. It has long been known as a native of Brazil. Dr. Lund found amongst the fossil remains from the caverns of the last mentioned country, some of which are apparently referrible to the Capybara, and others which he regards as indicating the former existence of a second species, to which he gives the name *Hydrochærus sulcidens*.

SUB-FAMILY, CHINCHILLINA.

Chinchillidæ. BENNETT, Transactions of the Zoological Society, vol. i. p. 58; Proceedings of the Zoological Society for May, 1833, Pt. 1, p. 57.

[1] Voyages of the Adventure and Beagle, vol. iii. being the Journal of Charles Darwin, M.A. Naturalist to the Beagle, p. 57.

Chinchillidæ. Waterh., Proc. Zool. Soc. for April, 1839, Pt. 7, p. 61; and for Nov. 1839, p. 172.

Chinchillina. Wagner, Wiegm. Archiv. fur Naturgesch. 1841, p. 120; Schreb. Säugth. Suppl. iii. p. 299 (1843).

Hystricidæ with rootless molar teeth, having parallel, or nearly parallel, transverse plates of enamel; the series of molars on either side of each jaw converging in front; tail long, or of moderate length, recurved, and bushy. Clavicles perfect; slender: fibula very slender.

Inhabit the mountains of Peru and Chili, and one species occurs in the plains of La Plata.

The sub-family *Chinchillina* forms a well-marked group among the Rodentia, and has furnished the subject of several monographs, each adding materials towards its elucidation, but at the same time towards the confusion of the nomenclature of the species. This latter was to a certain extent unavoidable, since several papers upon the Chinchillas were published nearly at the same time, and at different widely separated places. But it is to Mr. Bennett that we are indebted not only for the first strict definition of the group, but likewise for the most important details relating to the species.

The Chinchillas present certain characters which link them to the Cavies, Octodons, and Hares; and we find likewise considerable approximation of one of the *Echimyina* (the Capromys) to the present group. In the shortness of the brain cavity, the general imperfection of the palatine portion of the cranium, the narrowness of the sphenoids, the large size of the openings in their lateral wings, as well as the large size of the occipital opening, the narrowness of the occipital condyles, and, in the fact, that a very considerable portion of the supra-occipital bone enters into the composition of the roof of the skull, we find characters which justify the approximation of the Chinchillas to the Hares. The palate, in the Chinchillas, is still more imperfect than in the Cavies, and

the incisive openings are larger; and the parallel arrangement of the enamel plates of the molar teeth, combined with the greater height of the condyloid portion of the lower jaw, are points in which the Chinchillas evince a nearer affinity to the Hares than do the Cavies[1]. As, however, the Chinchillas and Hares are essentially of two very distinct types of the Rodent structure, and the characters just alluded to are for the most part characters indicative of a low grade of organization, it would seem that the amount of resemblance which exists between these two groups, or between the Cavies and the Hares, rather arises from these lowest members of the *Hystricidæ* being nearly parallel in rank, in the animal scale, with the *Leporidæ*, and does not indicate an affinity of a very near degree.

As regards the resemblances which the Chinchillas bear to the other groups mentioned, I will only here state that, in addition to those characters which are common to the *Hystricidæ*, the members of the present section show their nearer affinity to the Cavies, Octodons, and *Capromys*, than to others of the family, in their having the molar teeth rootless. The short and triangular form of the portion of the palate which lies between the molar teeth, the comparatively great space which separates the hinder molars, the curvature of these teeth, and in the form of the zygomata, are characters which link the Chinchillas to the Cavies more nearly than to the other sections just mentioned. Here, as in the Cavies, the zygoma has no descending process on its under surface, and its anterior root, in leaving the sides of the muzzle, is almost immediately directed backwards as well as outwards, and even has a slight tendency to descend, as in the Cavies[2]. On the

[1] In these remarks I allude more especially to the Chinchillas forming the sections *Lagidium* and *Chinchilla*; the Viscacha furnishes some exceptions, which will be pointed out.

[2] The zygoma, however, descends much more in the Cavies than in the

other hand, in the comparatively small size of the lachrymal bone, in having the ala of the sphenoid wedged in between the maxillary and the temporal bones, as well as in the form of the lower jaw, the Chinchillas depart from the Cavies, and resemble the Octodons.

The sub-family *Chinchillina* contains species fitted by their structure to live on the mountains, forming the genera *Chinchilla* and *Lagidium;* and one species, which is an inhabitant of the plains: it forms the genus *Lagostomus.*

Genus, *Lagostomus.*

Lagostomus. Brookes, in Linnean Transactions, vol. xvi. Part 1, p. 102. 1829.
" Bennett, *Transactions of the Zoological Society*, vol. i. p. 59.
" Wagner, Schreb. Säugth. Suppl. iii. p. 309.

Chinchillina with the molar teeth composed of two narrow lamellæ; the hindermost upper molar with three lamellæ; fore feet with four toes, armed with shortish, arched, and pointed nails; hind feet with three toes, provided with long, compressed, and sharply-pointed nails: upper lip with a vertical groove; muffle broad and expanded.

The genus *Lagostomus* is easily distinguished from the other *Chinchillina* by the reduced number of toes to its hind feet, and the comparatively long nails with which they are provided; the nails of the fore feet, moreover, although they are by no means large, are still considerably stronger and more produced than in the mountain Chinchillas. Another striking difference is observable in the structure of the molar teeth, these (with the exception of the hinder-

Chinchillas; indeed so much that its lower edge, in the middle of the arch, lies considerably below the level of the crowns of the molar teeth: in the Octodons the molar teeth descend far below the level of the zygomatic arch, and in the Chinchillas they descend but little below.

most molar of the upper jaw) having but two plates composed of dentine and surrounded by enamel. The three foremost molars of the upper jaw approach to a square form, but have the antero-posterior diameter about one-third less than the transverse one, and each tooth is divided into two very nearly equal parts by a transverse plate of enamel—at least such appears to be the case; but upon removing one of these teeth from its socket, and examining its base, it will be seen that this mesial plate is composed of two layers of enamel which enter from the inner side of the tooth, and, running parallel with each other, are not united till they reach the opposite side: here the small loop formed by their junction is met by a slight indentation of the enamel of the outer surface of the tooth. The hindermost upper molar differs from the rest in having three transverse laminæ, and in being rather longer than broad. The molars of the lower jaw resemble the foremost of those of the upper, excepting that their transverse diameter is relatively greater. All the molars are deeply implanted in the jaw, and distinctly curved; those of the upper jaw have the convex surface directed forwards and slightly inwards, and those of the lower jaw are reversed as regards the relative positions of the convex and concave parts. The incisor teeth are moderately broad, and have the depth and width nearly equal: their enamelled surface presents several indistinct, small, longitudinal furrows. The upper incisors are less strongly arched in front than usual, and the lower pair are but little curved as compared with the incisors of most other Rodents; they terminate behind, nearly beneath the hinder margin of the last molar.

The genus *Lagostomus* contains but one species—the Viscacha—and the remaining points of distinction are noticed in the description of that animal.

LAGOSTOMUS TRICHODACTYLUS.

The Viscacha.

Plate 5, fig. 1.

Lagostomus trichodactylus.	BROOKES, Linn. Trans. xvi. p. 95, Pl. 9.
" "	LESSON, Illustr. de Zool. Pl. 8.
" "	BENNETT, Trans. of the Zool. Soc. i. p. 60.
" "	WAGNER, Schreb. Säugth. Suppl. iii. p. 310.
Callomys Viscacia.	Is. GEOFF. et D'ORBIGNY, in Annales des Sci. Nat. for Nov. 1830, xxi. p. 291.
Lagostomus Viscacha.	MEYEN, Nov. Act. Bonn. xvi. p. 584.
Dipus maximus.	(DE BLAINV.) DESM. Nouv. Dict. d'Hist. Nat. xiii. p. 117; Mammalogie, Pt. 2, p. 315.
La Vizcache.	AZARA, Essais sur l'Hist. Nat. des Quadr. de Paraguay, ii. p. 41.
Marmot Diana.	GRIFF., Trans. of Cuvier's Animal Kingdom, iii. p. 170, with Plate.

Body stout; limbs powerful; tarsi long; ear nearly half as long as the head, broad at the base, narrow at the opposite extremity, being distinctly emarginated behind: fur soft, and moderately long; general hue of the upper parts of the animal grey, somewhat mottled with dusky, and distinctly pencilled with black; the whole of the under parts white, or yellow-white: a broad dusky, or black band, extends, on either side, from the muzzle to the back part of the cheek; an equally broad white band crosses the muzzle, and terminates on each side beneath the eye, and a third narrow band passes across the forehead, which is of a dusky hue: tail about half the length of the body, for the most part of a dusky brown or blackish colour, and clothed with long hairs on the upper surface.

Inhabits La Plata.

The Viscacha is well described by Azara in his work upon the Quadrupeds of Paraguay, but was so little known to the European naturalists that it was not recognized when a living specimen was brought to this country thirteen years after the

appearance of that work. MM. De Blainville and F. Cuvier both made notes upon this specimen, which was exhibited in the Menagerie at Exeter Change, and the former of these authors gave to the animal the name *Dipus maximus*, supposing it to be a gigantic member of the Gerboa group. The same specimen is figured under the name *Marmot Diana*, in Griffith's Animal Kingdom. After its death it became the property of Mr. Brookes, by whom many important points in its structure (more especially relating to the teeth and skeleton) were for the first time made known to us. This able anatomist soon perceived that there were many striking points of distinction between the Viscacha and Gerboa, or, indeed, between that animal and any other then known Rodent; and, in his Memoir in the Linnean Transactions, founded upon it the new genus *Lagostomus*, and substituted the specific name *trichodactylus* for that of *maximus* previously given; the latter name not being applicable to the only known species of a genus.

The stout-bodied and strong-limbed Viscacha would, upon a cursory inspection, scarcely be regarded as a member of the same small group as the delicately made and active little Chinchilla, and yet in all essential points of structure these animals are most clearly framed on the same model, and the differences which they present remind us of the modifications of structure observable in the Squirrels and Marmots; the former light and active, and the latter of comparatively large size, strong and powerful, and fitted for burrowing habits: they are, in fact, burrowing Squirrels, whilst the Viscacha (which has been mistaken for a Marmot) is a burrowing Chinchilla.

The head of the Viscacha is large, and flattened above; the eyes large, and placed nearer to the ears than to the end of the muzzle; the ears are about half as long as the head, or rather less, and clothed (rather sparingly) with remarkably

fine, and moderately long hairs; those springing from the anterior margin are very long, and form a fringe; they are some of them, of a pale grey-brown colour, whilst others are white, as are likewise the hairs on the inner surface, and on the hinder part of the outer surface of the ear; near the anterior margin externally, they are brownish. The terminal portion of the muzzle is very blunt, and the muffle is clothed throughout with velvet-like hairs of a brown colour; it is nearly twice as broad as high, and almost flat; presents no distinct mesial groove, but has two principal folds which diverge from the centre of the lower edge of the muffle, and external to these diverging grooves, are the long and narrow nostril openings, which take the same direction, and are capable of being closed at the will of the animal by a lappet of skin which lies above them. There is a vertical fold in the upper lip, extending from the muffle to the incisor teeth, but the upper lip cannot be said to be cleft in the same manner that we find it in the Hares—it is merely notched above the incisors; no part, that I can perceive, is destitute of hairs. The palms of the fore feet are naked, and of a flesh colour: a large semicircular pad at the base of the toes is separated by a transverse groove from a still larger pad behind, which is nearly of a triangular form. The fore toes are short and stout, and differ but little in length; the nails with which they are terminated are about a quarter of an inch in length, concave beneath, and arched and somewhat keeled above; like those of the hind feet, they are nearly white. The tibia is long, and so is the tarsus; the under surface of the latter presents a long, callous, flat pad behind, but the anterior half of the metatarsus is clothed with hair beneath; the toes are naked beneath, long, and powerful; the middle toe presents a remarkable swelling at the extremity, on the upper surface, and this is thickly beset with extremely stiff, curved, white bristles, which are for the most part about

a quarter of an inch in length: similar bristles are observable at the base of the nail, and springing from the upper surface, of the inner toe. They are, no doubt, used by the animal to cleanse its fur. The nails are long, but little curved, solid, and keeled on the upper edge; the nail on the middle toe, which is the longest, is usually about three-quarters of an inch in length. The fur of the animal is soft, and moderately long, and varies somewhat in its colouring in the different specimens of the Viscacha which are found in our collections. The colour of the upper parts of the body is usually greyish; sometimes suffused with brown, and sometimes with a yellowish, or even a faint rufous cast, but always somewhat mottled with dusky, and more or less distinctly pencilled with black; the black pencilling is due to numerous long and comparatively coarse hairs mingled with those of the ordinary fur, the exposed ends of which are black. One of two specimens brought by Mr. Darwin from Buenos Ayres, has the whole of the under parts of the body of a delicate yellow, but in five other specimens which I have examined, these parts were pure white, as well as the inner surface of the limbs. The feet are usually white, but the tarsi are usually suffused with brown externally, becoming darker towards the lower and under part. A broad white band crosses the muzzle in the middle, and passes downwards and backwards on either side, to terminate beneath the eye; and immediately behind this band a dusky mark (more or less distinct) is observed to cross the forehead; it bends slightly forwards in the middle; above each eye is a distinct white spot, and numerous longish, but not very coarse, black hairs spring from this part. The hairs of the moustaches are numerous, and remarkably long and stout, some of them as much as six inches in length. The sides and under surface of the tail are clothed with coarse and shortish hairs, sometimes entirely of a dusky brown colour, but usually this tint is found on

the under surface, and the sides are whitish: the upper surface of the tail is densely clothed (excepting near the root) with very long and somewhat coarse hairs: those at the extremity of the tail are the longest, measure from two to three inches in length, and form a large brush, or tuft.

Azara mentions, that a female Viscacha which he examined, differed from a male which he describes, in wanting certain coarse bristles on the cheeks; and I may mention that a specimen which died in the menagerie of the Zoological Society, and which was found to be a female upon dissection,[1] wanted the coarse bristles in question, and there are two specimens in the British Museum collection where they are likewise wanting. In these specimens there are a few coarse long black hairs on the cheeks, but these are flexible, and unlike the bristles which I observe in three other specimens, which it may therefore be presumed are males. Here broad black band is observed passing along the side of the muzzle, and terminating on the hinder part of the cheek, and this band is formed of long, and extremely stiff, black bristles, which rattle like the quills of the Porcupine when the hand is passed over them: they are directed downwards and backwards. The same specimens have scattered long black bristly hairs on the sides of the neck and across the shoulders; and they differ, moreover, from the specimens in which the cheek bristles are wanting, in having the chin and throat covered with spiny hairs, the same part in the other

[1] This animal was dissected by Prof. Owen, who communicated a paper on its anatomy to the Zoological Society, which will be found in the Proceedings of that Society for Decemher, 1839. The same specimen was examined by myself immediately after its death, and it is from my notes then made that many of the details of the above description have been extracted. In it I found but four mammæ, and the two on either side of the body were remarkable for their forward position, the first being an inch and a half behind the base of the fore leg; the second was about two inches behind this; they were very distinct, long, and slender. The dimensions of this specimen are given in the first column of admeasurement, which are seen in the next page.

individuals referred to, being clothed with exceedingly soft fur.

	Female. Zoolog. Soc.		Male? from Buenos Ayres.		Male? Zoolog. Soc.		Male? British Mus.		Female? British Mus.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
From nose to root of tail	19	0[1]	26	0	23	0	24	0	23	0
" " to ear ...	4	3	5	0	4	9	4	3	4	3
Length of ear	1	10	1	9	1	9	1	9	1	9
" of tail, without the hair ...			8	0	7	0	8	0	6	0
" of ditto, including the hair					8	6	10	6	8	6
" of fore foot, without the nails			1	9	1	9	1	8	1	5
" of nail of longest toe				5		4½		3½		
" of hind foot, without the nails	4	5	4	8	4	8	4	10	4	5
" of nail of middle toe				9		9½		9		
Height at shoulder, about			9	0			8	0		

The skull of the Viscacha differs from that of the Mountain Chinchillas in the great strength of its parts, the less contracted form of the bodies of the sphenoids, as well as of that of the occipital bone, the smaller size of the incisive foramen, and much less inflated auditory chamber: here no part of the petro-tympanic bone is visible on the upper surface of the skull, which terminates behind in a well-developed occipital ridge, up to which the parietal bones are extended; the zygomatic arch is stouter, but less deep, especially beneath the fore part of the orbit. The malar bone here, as in

[1] Measured in a straight line; in the other dimensions, taken from stuffed specimens, the length of the animals is given as measured over to curve of the back.

the species of *Lagidium*, runs up in front to join the lachrymal bone. The nasal bones are broader than in the Mountain Chinchillas, and in the Viscacha's skull there is a bony plate projecting from the anterior root of the zygoma, and which forms the outer boundary of a tolerably deep channel for the infra-orbital nerve: this plate does not exist either in *Chinchilla* or *Lagidium*. The coronoid process of the lower jaw is more forward in its position and less elevated, and the ridge on the outer surface of the ramus, which runs obliquely downwards and forwards from the condyle, is very strongly developed; it is the same ridge being carried more forward, which gives such a peculiar form to the lower jaw of the Cavy.

	Female.		Sex unknown.		Male.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Total length of skull	4	0	4	2	4	7
" width near the hinder root of the zygoma	2	7	2	6	2	9
Width of the occiput	1	9	1	8½		
" between orbits	1	2	1	3		
Length of nasal bones	1	7	1	9	1	10
Greatest width of ditto, which is rather in front of the middle		8		8½		9
Width of ditto behind		5½		6½		6½
From incisors to molar teeth	1	3	1	3¼	1	5¾
Length of four upper molars taken together		11½		11¾	1	0
Width of upper incisor teeth		4½		4½		4½
" of palate between foremost molars ...		1¼		1½		2⅓
Ditto between the hindermost		8		8		9
Length of lower jaw			3	2½	3	7
Height of ditto, measuring from the condyle			1	3⅓	1	7

The following interesting account of the habits of the Viscacha, from Mr. Darwin's Journal, leaves little to be desired.

" The Viscacha is well known to form a prominent feature

in the zoology of the Pampas. It is found as far south as the Rio Negro, in lat. 41°, but not beyond. It cannot, like the Agouti (*Dolichotis Patachonica*), subsist on the gravelly and desert plains of Patagonia, but prefers a clayey or sandy soil, which produces a different and more abundant vegetation. Near Mendoza, at the foot of the Cordillera, it occurs in close neighbourhood with the allied Alpine species. It is a very curious circumstance in its geographical distribution, that it has never been seen, fortunately for the inhabitants, in Banda Oriental, to the eastward of the river Uraguay; yet in that province there are plains which appear admirably adapted to its habits. That river has formed an insuperable obstacle to its migration, although the broader barrier of the Parana has been passed, and the Viscacha is common in Entre Rios (the province between the two rivers), directly on the opposite shore of the Uraguay. Near Buenos Ayes these animals are exceedingly common. Their most favourite resort appears to be those parts of the plain which during one half of the year are covered with great thistles, to the exclusion of other plants. The Gauchos affirm that it lives on roots, which, from the great strength of its gnawing teeth, and the kind of localities frequented by it, seems probable. As in the case of the Rabbit, a few holes are commonly placed together. In the evening the Viscachas come out in numbers, and there quietly sit on their haunches. They are at such times very tame, and a man on horseback passing by, seems only to present an object for their grave contemplation. They do not wander far from their burrows. They run very awkwardly, and when hurrying out of danger, from their elevated tails and short front legs, much resemble great rats. Their flesh, when cooked, is very white and good, but it is seldom used.

"The Viscacha has one very singular habit; namely, dragging every hard object to the mouth of its burrow. Around each group of holes many bones of cattle, stones, thistle-

stalks, hard clumps of earth, dry dung, &c. are collected into a heap, which frequently amounts to as much as a wheelbarrow would contain. I was credibly informed, that a gentleman, when riding on a dark night, dropped his watch; he returned in the morning, and by searching in the neighbourhood of every Viscacha hole on the line of road, as he expected, soon found it. This habit of picking up whatever may be lying on the ground anywhere near its habitation, must cost much trouble[1]. For what purpose it is done I am quite unable to form even the most remote conjecture: it cannot be for defence, because the rubbish is chiefly placed above the mouth of the burrow, which enters the ground at a very small inclination."

The chief distinguishing characters of the alpine Chinchillas may be summed up as follows:—

Chinchillina with the molar teeth each composed of three narrow transverse lamellæ; ears large; tail long and bushy; tarsi entirely naked beneath; the nails of the toes short; auditory bullæ large.

This little group is confined to the Andes of Chili, Bolivia, and Peru, and the species which it contains are remarkable for the extreme softness of their fur. In connexion with the large size of the external organs of hearing, we find the bony chamber of the ear of unusually large size in these animals: the petrous, tympanic, and mastoid portions of the temporal bone here unite to form a large and irregular bulb, which not only increases the occipital surface of the cranium, but likewise, to a more or less degree, enters into the composition of the upper part. With regard to the molar teeth, I may here

[1] In the Satin birds (*Ptilonorhyncus*) of Australia, Mr. Gould noticed a similar propensity to collect together various bright-coloured or glittering substances; these it arranges around a kind of bower, formed by sticks and other materials; for what purpose, is not known.

observe, that the foremost of the three narrow plates of which each tooth is composed (and which is formed of dentine and surrounded by enamel), is rather less extended in the transverse direction than the other two, in the grinders of the lower jaw; whilst, in the molars of the upper jaw, the hindermost plate is the shortest. Some slight differences are observable in the form of the last upper, and foremost lower molars, which are hereafter alluded to.

The fore limbs are small and weak; the hind limbs toes; and relatively strong. The fore feet have four or five long, the hind feet have four toes, of which the outermost is much shorter and smaller than the rest, and terminates at the commencement of the anterior third of the foot: of the three large toes, the central one is the longest, and the inner one the shortest. All the toes are terminated by a very large and somewhat compressed fleshy pad, above which the small nail is placed: the nails are rather strongly arched, pointed, and hollow beneath, and scarcely project beyond the fleshy portion of the toe: they are more or less hidden by longish hairs which spring from the end of the toe, and the nail of the inner toe of the hind foot is completely hidden by a tuft of very stiff and curved bristles. The naked soles of the feet are black: a large, hardened, flat pad, covers the hinder half of the tarsus.

To the three species of Alpine Chinchillina described by Mr. Bennett in his monograph of the group, in the Transactions of the Zoological Society, a fourth has been added—the *Eriomys Chinchilla* of Lichtenstein, which there are grounds to believe is a good species. They agree so closely together in most of the details of their structure, that it would have been well to have associated them under one generic title, and to have formed sub-generic divisions only, upon the distinctions furnished by the number of the toes of the fore feet. We then could have distinguished, by the rank

of the divisions, the greater amount of difference which characterizes the genus *Lagostomus*, from the minor distinctions which separate *Lagidium* from *Chinchilla*—two sections which have been formed of the Alpine *Chinchillina*, and which are regarded as genera.

Genus, *Lagidium*.

Lagidium. MEYEN, Nova Acta Acad. Nat. Cur. Bonn. vol. xvi. Part 2, p. 576, March, 1833.
" WAGNER, Schreb. Säugth. Supp. iii. p. 305.
Lagotis. BENNETT, Proceedings of the Zool. Soc. for May, 1833, Part 1, p. 58.—Trans. Zool. Soc. vol. i. p. 59.

Alpine Chinchillas with four toes to the fore feet ; ears elongated.

LAGIDIUM CUVIERI.

Cuvier's Chinchilla.

Plate 7, fig. 1.[1]

Lagotis Cuvieri. BENNETT, Proc. Zool. Soc. for May, 1833 ; Trans. Zool. Soc. vol. i. p. 46.
Lagidium Cuvieri. WAGNER, Schreb. Säugth. Suppl. iii. p. 306 (1843).
? *Lagidium Peruanum*. MEYEN, Nova Acata. Acad. Nat. Cur. Bonn. xvi. Part 2, p. 578.
" " TSCHUDI, Fauna Peruana, Pt. 4, p. 164 (1845).
Callomys aureus. IS. GEOFF. et D'ORBIGNY, Ann. des. Sci. Nat. xxi. p. 291 (1830).

Ears rather shorter than the head; fur very soft, its general hue ashy grey, suffused with yellowish, and somewhat pencilled with black ; under parts of a very pale yellow, but somewhat richer towards the sides of the body: feet grey ; tail black beneath, and with very long hairs above, some of which are black : a narrowish black line runs along the back, but does not extend to the root of the tail.

Inhabits the Andes of Chili, Bolivia, and Peru.

[1] ***Lagidium Peruanum*** **on the Plate.**

The animal described by Mr. Bennett under the name *Lagotis Cuvieri*, is smaller than most other specimens I have examined, and which appear to me to be referrible to the same species. Its general tint may be described as ashy grey, but with a mixture of dirty yellow, and somewhat pencilled and mottled with dusky: under parts of the animal pale yellow; towards the sides of the body, and root of the tail, of a richer yellow hue; sides of muzzle, palish yellow; cheeks suffused with yellow. The ears are of an elongated oval form, scantily clothed with grey-white hairs, but on the outer surface, towards the tip, as well as near the anterior margin, somewhat dusky. The hairs of the moustaches stout, and immensely long, the longest measuring as much as seven inches; they are entirely black. The feet are densely clothed with hairs, the general hue of which is grey, but the hairs are brownish at the root, and most of them very pale at the point; the strong bristles on the inner toe of the hind foot are black: the nail beneath these bristles differs from the nails of the other toes in being broad and truncated. The tail, at the root, is clothed with fur like that on the body; this, however, extends but a short distance—about an inch and a half; the sides, and under surface of the remaining portions, are well covered with stiff hairs of about half an inch in length; those on the under part of the tail are black, and those on the side for the most part dirty white; the long bushy hairs are confined to the upper surface of the tail, and gradually increase in length as they approach the point of the organ, where their average length is about three inches; along the mesial line of the tail, and at the point, they are almost entirely black, but towards the sides, the greater portion of them are dirty white. The hairs on the back, taken singly, are pale grey at the root, dirty yellow-white at the point, and grey-brown below this pale part; many of them are slightly tipped with dusky, and there are longer interspersed hairs which have the

visible extremity black. Along the mesial line of the back, all the hairs are black at the point, and hence there is a black dorsal line; this is about half an inch in width, and is gradually obliterated towards the hinder part of the back. *The hairs on the* under part of *the body* are ashy grey at the root, and pale yellow at the point.

	Ins.	Lines.
Length from tip of nose to root of tail ...	16	6
" from ditto to ear, about	3	2
" of ear	2	8
Greatest width of ditto	1	10
Length of tail, not including the hair, about	11	0

The dimensions of the skull will be found with those of other crania about to be noticed. The total length of the skeleton, according to Mr. Bennett, is twenty-four inches and six-tenths; of which the caudal vertebræ occupy one foot and $\frac{4}{10}$ths of an inch; the length of the fore foot to the end of the middle finger is $1\frac{4}{10}$ths of an inch; of the hind foot, $3\frac{6}{10}$ths inches.

The locality from which this specimen was obtained is not known; it was brought alive to this country, and lived for a considerable time in the menagerie of the Zoological Society.

Amongst numerous specimens of *Lagidium* brought to this country by Mr. Bridges were four, agreeing very nearly with Mr. Bennett's animal, having the same yellow-grey hue: one of these (now in the collection of the British Museum) was procured on the east side of the Andes, between Villavicencia and Uspallata, at an elevation of between four and five thousand feet[1]; the remaining three were shot in Bolivia, in the

[1] According to the various accounts of the habits of these animals, which I have read, it is very unusual to meet with them at so small an elevation. This specimen may be described as having the general colour palish ashy grey, slightly suffused with yellow on the sides of the body, and somewhat brownish on the back: the dorsal stripe is dusky brown: the sides of the muzzle, lower part of cheeks, the fore legs, and the whole of the under parts, of a distinct

vicinity of Potosi. Other specimens in Mr. Bridges' collection were procured, as that gentleman informs us, to the west of La Paz, on the east side of the Andes, at an elevation of perhaps fifteen thousand feet. They differ considerably in their colouring from the animal described by Mr. Bennett, and are, moreover, of large size. The following description is from one of these specimens, now in the British Museum.

Incisor teeth white: hairs of the fur about an inch in length on the back; rather longer on the hinder parts; its general hue on the upper parts of the animal, bluish grey; the hairs pale grey at the root, gradually shaded into brownish grey externally, and grey-white at the point; the longer interspersed hairs, black externally: chin, throat, chest, and abdomen, as well as the under side of the tail at the root, and the inner surface of the limbs, of a bright yellow colour. Ears rather sparingly clothed with grey-white hairs; or, near the fore part, and at the tip, externally, with brown-black hairs. Fore feet nearly white, but with the longish hairs springing from the ends of the toes, dusky; hind feet ashy grey, rather dark on the outer side, and pale on the inner; the longer hairs at the end of the toes, as well as the stiff bristles which spring from the extremity of the inner toe, blackish. Tail as long as the body, and very bushy; the long hairs, however, confined to the upper surface; at the end of the tail, where they are longest, measuring four inches and upwards in length; they are some of them dirty white and

yellow; the fore feet almost white; the hind feet greyish, but with the inner surface, as well as the heel externally, dirty pale yellow: ears, externally, of a pale brown-ash colour, but with a narrowish white band along the anterior margin, and a similar one at the hinder margin, the tip somewhat rufous: a large rufous patch on the crown of the head: tail brown-black beneath; the long hairs on the upper surface are some of them brown-black, with whitish points, but very many of them are dirty white throughout.

some black, on the mesial line of the tail; chiefly dirty white near the sides, and black at the end of the tail; the shorter hairs on the under surface, black. Hairs of moustaches, black. A black mark runs along the back, commencing in a line with the shoulders, and terminating over the loins.

	Brit. Museum.		Zool. Society.		Yellow-grey variety. Brit. Museum.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length from tip of nose to root of tail ...	19	0	20	6	16	6
" *from ditto to ear*	3	8	3	7	3	4
" of ear	3	0	2	11	2	8
Greatest width of ditto	1	11	2	0	1	8
Length of fore foot	1	8	1	10	1	7
" of hind foot	4	2	4	4	3	7
" of tail, without the hair	12	6	12	0	12	0
" of ditto, including the hair, about	16	6	16	0	16	0

I have added the dimensions of a second specimen, from Mr. Bridges' collection, contained in the Zoological Society's museum; it agrees with the specimen just described in its colouring. The dimensions of the skull of the animal last referred to are given below, in the second column of admeasurements; those in the first being from the animal described by Mr. Bennett, and those in the third column are from a skull in the British Museum, which was removed from one of Mr. Bridges' specimens, which agrees with the above description.

	Yellow-grey variety. Mr. Bennett's specimen.		Blue-grey variety. British Museum.		Blue-grey variety. Zoolog. Society.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Total length of skull	3	1	3	8	3	5
Width at the occiput	1	$2\frac{2}{3}$	1	$4\frac{1}{4}$	1	$3\frac{1}{4}$
" measured from outer surface of zygomatic arches	1	8	1	$9\frac{1}{2}$	1	$9\frac{3}{4}$
" between orbits		10		$9\frac{1}{2}$		$9\frac{1}{2}$
Length of nasal bones	1	$0\frac{1}{2}$	1	$6\frac{1}{2}$	1	4
Width of ditto in front		$4\frac{1}{3}$		$5\frac{1}{4}$		$5\frac{1}{3}$
" " behind		$3\frac{3}{4}$		$4\frac{1}{2}$		4
Space between upper incisors and molar teeth		$10\frac{1}{3}$	1	$0\frac{1}{2}$	1	0
Length of the four upper molars taken together		$8\frac{1}{2}$		10		$9\frac{1}{3}$
Width of incisors		$2\frac{2}{3}$		3		$2\frac{3}{4}$
Length of lower jaw	2	$1\frac{1}{2}$	2	8	2	$4\frac{1}{3}$
Height, at the condyle		$10\frac{1}{3}$	1	0	1	$0\frac{1}{4}$
Length of angular portion	1	0	1	3	1	$1\frac{1}{2}$

A notice of the habits of this animal will be found in the account of the *Lagidium pallipes*.

Lagidium Peruanum. MEYEN.

This animal is usually supposed to be identical with Mr. Bennett's *Lagotis Cuvieri*, but I have never seen a specimen of the *L. Cuvieri* in which the under parts of the body are white, as described by Dr. Meyen, and in which the dorsal black stripe is wanting, as would appear to be the case in the *L. Peruanum*, since it is not mentioned in the account of that animal. The stripe is sometimes wanting in the *L. pallipes*, and this leads me to suppose the *L. Peruanum* may be of the same species as that animal, which is more generally diffused in Peru than the *L. Cuvieri*: moreover, the length

of the *L. Peruanum*, according to Dr. Meyen, is about sixteen inches, which is inferior to that usually found in *L. Cuvieri*, and more nearly accords with *L. pallipes*. Unfortunately the length of the ears is not mentioned in Dr. Meyen's description.

Callomys aureus. Is. Geoff. et D'Orb.

Founded upon a skin in which there were neither ears, feet, nor tail. The fur is said to be yellow, with a greenish cast on the back of the animal; slightly undulated with black, and with a black dorsal stripe: the under parts golden yellow. Length, about twenty inches. It is most probably a variety of the *Lagidium Cuvieri*.

LAGIDIUM PALLIPES.

The Pale-footed Chinchilla.

Lagotis pallipes.	Bennett, Proceedings of the Zoological Society for May 1835, Part 3, p. 67; Trans. Zool. Soc. Vol. 1, p. 331, Pl. 42.
Lagidium pallipes.	Wagner, Schreb. Säugth. Suppl. iii. p. 308 (1843).
" "	Tschudi, Fauna Peruana, Part 4, p. 165 (1845).

Ears about one-third shorter than the head; fur on the upper parts of the animal of an ashy grey colour, much suffused with dusky brown; the whole of the under parts of a fawn-yellow, as well as the feet and inner side of the limbs; ears dusky brownish in front, externally; tail, with the long hairs springing from the mesial line of the upper surface, of a dusky brown colour at the root, and pale rufous brown at the point.

Inhabits the Bolivian and Peruvian Andes, extending northwards to the Republic of Ecuador.

The animal upon which Mr. Bennett founded the *Lagotis pallipes*, differs from the *L. Cuvieri* in being rather smaller,

and in having the ears relatively shorter. The general hue of its fur, moreover, is darker; arising from the longer dark-pointed hairs, mixed with those of the ordinary fur, being much more numerous, and likewise from the circumstance that the hairs of the ordinary fur (which are shorter than those of *L. Cuvieri*) being many of them dusky at the point. On the back is a trace of a dark dorsal stripe; but it is so indistinct, that it would scarcely be perceived, were we not led to look for it on account of the presence of such a mark in the *L. Cuvieri*. The fur of the back is grey next the skin, and each hair is of a dirty yellow-white colour at or near the point; and, immediately below the pale ring, the hairs are somewhat darker than at the root. The hairs of the throat, chest, and abdomen, are of an ashy grey colour at the root, and palish fawn-yellow externally; the yellow assumes a richer hue on the belly, and on the fore and hinder part of the fore legs. The feet are yellowish white; the tarsi slightly mottled with brownish on the outer surface. The sides of the head and neck are pale ashy grey; the lower part of the cheeks, and the sides of the muzzle, yellow. The ears are rather sparingly clothed with grey-white hairs internally, and likewise on the hinder part externally, but, on the fore part, they are dusky brown. The hairs of the moustaches are, for the most part, black; but some few are brown at the root and whitish at the point. The tail is clothed with somewhat coarse and short hairs at the sides and on the under surface; those at the sides are of a dirty yellow-white colour, but dusky brown at the root; and those on the under part are blackish brown. The long hairs on the upper surface are, many of them, of a dirty yellow-white colour; whilst others (chiefly confined to the mesial line) are blackish brown at the root, and rufous brown beyond; the longest of these hairs are about two and a half inches in length; these spring from the end of the tail, and are entirely black. The bristly hairs

which cover the extremity of the inner toe of the hind foot are silvery white. The feet are less densely clothed with fur than in *L. Cuvieri*.

	Inches.	Lines.
Length from tip of nose to root of tail ...	14	0
" *from ditto to ear*	3	0
" of ear	2	2
Width of ditto	1	5
Length of fore foot	1	2½
" of hind foot	3	0
" of the tail, not including the hair, about	9	6

Mr. Bennett's specimen of the *Lagotis pallipes* is supposed to have come from the Chilian Andes. An animal now in the British Museum, and which was procured by Mr. Bridges in the Bolivian Andes, in the neighbourhood of La Paz, at an elevation of about twelve thousand feet, I feel little doubt is specifically identical with Mr. Bennett's species just referred to, since it has the same comparatively short ears; but it differs in several respects from the specimen I have just described. The general colour of the upper and under parts of the body is the same, or very nearly so; but the fur is somewhat longer, its average length being full three-quarters of an inch; whilst that in Mr. Bennett's specimen is about half an inch. On the back is a dusky stripe; but this is less strongly defined than in the *L. Cuvieri*. The hind feet are dusky grey externally, and whitish on the inner side; and the bristles on the inner toe, instead of being silvery white, as in Mr. Bennett's specimen, are dusky. The ears are, for the most part, dusky on the outer side, but there is a narrowish white band along the fore margin, and a second at the hinder margin. The tail is covered at its base, for a distance from the root of about two inches, with soft fur like that on the body, as is also the case in *L. Cuvieri;* but in that animal this part of the tail is yellow beneath like the body, whilst here the soft fur on the tail is entirely grey:

this soft hair is followed by coarser hairs, and these at first are entirely black, the black being extended in the longitudinal direction about two inches; the hairs then begin to lengthen considerably on the upper surface of the tail, and increase in length to the point, where they are about three inches long; they are brown (some of them inclining to white, at the point), and black-brown at the root: the shorter hairs on the under surface of the tail are brown-black.

	British Museum.		*Lagotis pallipes.* From Dr. Tschudi.		*Lagotis Cuvieri (Peruana).* From Dr. Tschudi.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length, from tip of nose to root of tail ...	18	0	14	0[1]	15	0
" from ditto to ear	3	4				
" of ear	2	2	2	3	3	0
Width of ditto	1	3	1	3	1	4
Length of fore foot	1	3				
" of hind foot	3	9	3	4		
" of tail, not including the hair, about	11	6	10	0	11	0
" of ditto, including the hair ...	15	6	13	0	14	0

Dr. Tschudi, whose observations were made in the native country of the Chinchillas, or Viscachas, as the species of Lagotis are called (as well as the animal which inhabits the plains of La Plata), is quite satisfied that the present species is distinct from the *L. Cuvieri*, and notices the shorter ears and moustaches, the darker colour of the fur and its being tinted with yellow brown, and having numerous black waves, combined with the rufous feet, and distinctly distichous tail,

[1] I have not reduced Dr. Tschudi's dimensions to English measure, for I do not know what measure he uses; he may have stated in his work, but that I am unable to refer to.

as its principal distinguishing characters. Dr. Tschudi, moreover, states that the geographical range of the two species is different, and affords another proof of their specific distinction. Whilst the *L. Cuvieri* occurs only on the South Peruvian and Bolivian high lands, the *L. pallipes*, according to the author just mentioned, extends over the Puna and Cordillera regions of Middle and Northern Peru, as far as the Republic of Ecuador. The Puna and Cordillera regions[1], are alone inhabited by the Viscachas (*Lagotis*), which are usually met with at a height of from 12 to 16,000 feet above the sea; lower than 11,000 feet they rarely descend, and when seen as low as 9 or 10,000 feet, it is only in pairs or single individuals. The highest point at which the Viscachas were noticed by our informant, was at 15,800 feet of elevation, on the eastern slope of the Huijracocha[2]. In the province of Jauja (nearly in the latitude of Lima), Dr. Tschudi met with several Viscachas, which were entirely black: he was unable to procure a specimen, but is of opinion they were mere varieties of the *L. pallipes*, which was met with in abundance not many thousand paces from the spot in which the black specimens were seen.

The Viscachas commonly live in communities on the naked rocks, where (to use Dr. Tschudi's own words) a dry and scanty vegetation is scarcely to be seen. They quit their abodes, which are amongst the loose pieces of rock, shortly after sunrise and rather before sunset, and then display the most extraordinary activity, leaping from rock to rock; in a moment, as it appears, they may be seen to ascend an almost precipitous rock of twenty or thirty feet in height, and if fired at, they disappear as if by magic, having retreated to the

[1] The Puna region is the high table-land of about 12,000 feet of elevation, and the Cordillera region is on the ridges of the Andes themselves.

[2] I cannot find this place in the maps—perhaps it should be Huarmicocha, which is on the Andes, S. lat. about 13° 25′.

holes and crevices. The sunshine they scrupulously avoid, and it is therefore only in shaded spots they are seen, unless the day be cloudy. Their food consists of grasses, dry roots and mosses, and to procure this, they often have to wander far from their homes. Whilst eating they sit upon their haunches with the tail extended, and the food is held in the fore paws. They have many enemies, but appear to be very prolific, and Dr. Tschudi says he has met with the young at all periods of the year. The birds of prey (especially the condor) and foxes, as well as the shepherds' dogs, are their principal enemies. The Indians, by means of snares, capture large numbers of the Viscachas, both for their skins and flesh, the latter being well-flavoured; and the former is deprived of its fine and soft fur, which is mixed with wool, and woven into warm scarfs, &c., so much needed in the icy cold regions inhabited by these animals. The furs are moreover shipped to Europe, but are less prized than that of the true Chinchilla.

Genus, *Chinchilla*.[1]

Chinchilla. BENNETT, Gardens and Menagerie of the Zoological Society, Part I. p. 1 (1829): Transactions of the Zoological Society, Vol. i. p. 59.
" GRAY, Spicilegia Zoologica, Part II. p. 11, August 1830.
" ROUSSEAU, Annales des Sciences Naturelles, xxvi. p. 337 (1832).
Eriomys. LICHTENST, Darstellung neuer oder wenig bekannter Säugth. Tab. 28, 1829?
" VAN DER HOEVEN, in Bijdragen tot de Naturkundige Wetenschappen, vi. p. 115, 1831.
" WAGNER, Schreb. Säugth. Suppl. iii. p. 301 (1843).

***Alpine Chinchillas*, with large and rounded ears; five toes to the fore foot, and four to the hind.**

The teeth of the species of *Chinchilla* can scarcely be said to differ from those of *Lagidium*, the only distinction

[1] The names *Chinchilla* and *Eriomys* were applied to the present genus, it appears,

black likewise above, along the mesial line, as well as at the point; and dirty white at the sides.

Inhabits the Andes of Chili, Bolivia, [and Peru; extending northwards, on the east side of the mountains, as far as the 9th parallel of latitude, and having a vertical range of from about eight to twelve thousand feet[1]].

Although the furs of the Chinchillas have long formed an important article of commerce, the animal itself was almost unknown to naturalists until the year 1829, in the early part of which, Mr. Yarrell first pointed out the chief characteristics of its dentition[2], which, however, being examined under unfavourable circumstances, left to be desired a more detailed description. In the same year the animal was figured and described by Lichtenstein, and by Mr. Bennett, in his "Gardens and Menagerie," where the structure of the teeth, as well as the external peculiarities of the animal, are most fully described. The animal was again figured, and described in detail, by Mr. Gray, in the following year[3]; and Mr. Yarrell's notes on the internal anatomy of the Chinchilla, which appeared in the Proceedings of the Zoological Society for February 1831, has rendered our knowledge of the structure of the animal almost complete. The skull has been figured and described by Van der Hoeven, and subsequently by M. Rousseau, in the works quoted at the head of this account, and to Mr. Bennett we are indebted for a figure of the skeleton, stomach, and cæcum[4].

Dr. Tschudi informs us that Chinchillas are plentiful on

[1] It is possible that the remarks on the habitat and range, enclosed within brackets, refer to the next species.

[2] See the Zoological Journal for January, 1829, Vol. iv. p. 317.

[3] In his Spicilegia.

[4] See Plates 6 and 7 of Vol. 1 of the Transactions of the Zoological Society. The sub-family *Chinchillina*, scarcely known to Cuvier at the time of the publication of his last edition of the Règne Animal, is now more perfectly worked out than any other group of Rodents. Those who require further details than it is desirable to introduce into a general work, will find a full account of the internal and external peculiarities of two of the genera of the group in the

the east declivity of the Cordillera throughout Peru up to the 9th parallel of latitude, but he is not aware that they occur on the inner Cordilleras. Further south, Mr. Bridges met with the species here described both on the Bolivian and Chilian sides of the Cordillera; and I learn from this gentleman that the animal is very plentiful at Cobija. In its habits it greatly resembles the species of the preceding genus. The native hunters, according to Mr. Bridges, train a species of weasel (the Quique of Molina—*Galictis vittata* of Bell) to enter into the crevices of the rocks, where the Chinchillas lie hidden during the day, and capture them as they endeavour to make their escape.

The *Chinchilla lanigera* is about equal in size to our common squirrel, but appears to have a stouter form, owing to the greater length and density of its fur. Its muzzle is somewhat pointed; the eye large: the ears very large, with the length and breadth nearly equal; they are rounded at the extremity, and their broadest part is towards the base; the hairs with which they are clothed are moderately long and extremely slender—they are not sufficiently numerous to hide the skin of the ear. The fur is dense and extremely soft, about three-quarters of an inch in length on the back, and an inch or more on the hinder parts and sides of the body; the upper parts of the animal are of a very pale grey colour, or grey white, and more or less mottled with dusky, or black: the under parts, as well as the feet, are white, with a faint greyish, or yellowish tinge. The hairs of the moustaches, which are very long, are some of them white, and some black; the flesh of the ears is sometimes brown, and sometimes nearly black in preserved specimens, and the hairs which cover the anterior portion of their outer surface, and those near the margins, on the inner surface, are grey-brown: on

Transactions just quoted; and for the third genus, we must refer to Mr. Brookes' paper, chiefly on the skeleton, of the only known species, in the Linnean Transactions; and to Professor Owen's notes on its internal anatomy, contained in the Proceedings of the Zoological Society, Part VII. p. 175.

the other parts of the ears the hairs are silvery white. The tail, excepting at the base, where it is covered with fur like that on the body, is clothed with coarse hairs; those on the upper surface average about an inch and a half in length, and those on the sides and under surface are most of them about half an inch in length; the long hairs on the upper part of the tail are dirty white at the root and point, and brown-black in the middle, the dark colour being much extended; the sides of the tail are dirty white, and the under surface brown. All the fur on the body of the animal is of a deep slate-grey colour next the skin.

	No. 1.[1]		No. 2.		No. 3.		No. 4.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines	Ins.	Lines.
Length from tip of nose to root of tail	10	6	9	2	9	0	10	3
" from ditto to ear	2	5	2	3	2	2	2	3
" *of ear*	*1*	*10*	1	9	1	7½	*1*	9
Width of ditto	1	10	1	7½	1	8	1	10
Length of fore foot		10		9½		9½		10
" *of hind foot*	2	4½	2	2	2	1¼	2	2½
" of tail, without the hair..	5	0	5	9	5	0	5	9
" of do., including the hair			7	6	7	0	7	6

The animal, of which the admeasurements are given in column No. 4, differs from other specimens in our collections

[1] The dimensions in column No. 1 are taken from a specimen in the Zoological Society's museum, and which lived in the Society's menagerie for some time; it was presented to the Society by Lady Knighton, and is a specimen referred to by Mr. Gray, Mr. Bennett, and Mr. Yarrell, in their accounts of the Chinchilla. It is said to be from Coquimbo. The admeasurements of column No. 2 are from a specimen in the collection of the British Museum, to which collection it was presented by Mr. Collie, and is alluded to by Mr. Gray in his "Spicilegia Zoologica." I mention this because Dr. Wagner imagines that the species described by Mr. Gray is distinct from that described by Mr. Bennett. All the specimens in the British Museum and in that of the Zoological Society I am satisfied belong to the smaller of the two species described by Dr. Wagner. The dimensions in the third column are from a specimen in the British Museum, procured either in Chili, or Bolivia, by Mr. Bridges.

in having the upper parts of the body suffused with brownish; the points of the hairs here are dusky, but with an admixture of red. The sides of the body are of a very pale ashy grey hue, and the under parts are white, slightly tinted with cream colour. It is a most elegant little animal, and forms part of the series in the British Museum collection. The skull, removed from this specimen, has the muzzle more elongated than in three other Chinchilla skulls which I have before me. Its dimensions are given in the first column of the following series:—

	British Museum.		Zoological Society[1].		Zoological Society.		British Museum.		Leyden[2].	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Total length of skull ...	2	5½	2	3½	2	3½	2	2½	2	2½
Width behind	1	2¼	1	2	1	1⅔	1	1½		
" from the outer surface of the zygomatic arches .	1	3	1	3¼			1	2	1	1½
Length of nasal bones .		10¾		9⅔		9⅓		9		
Width of ditto behind .		3⅓		3¼		3		3		
" " in front .		3½		3⅔		3½		3		
" between orbits .		5¼		5⅓		5½		4¾		5⅓
Vertical diameter of the auditory bullæ .		11½		11¼		11¼		11		
Antero-posterior diameter of ditto ...		11		10¼		10		9¾		
From incisor to molar teeth		7		6⅓		6¾		6½		6⅓
Width of incisors ...		2		2⅙		2		2		1⅚
Length of the four molars, taken together		6		6		6		5⅔		5¾
Length of lower jaw ...	1	8¾	1	8½			1	7		
Height of ditto, behind		8⅓		8⅓				7½		
Length of angular portion		10⅓		10¾				9		

[1] The dimensions in this column are from the skull belonging to the skeleton described by Mr. Yarrell and Mr. Bennett. The skull of which the admeasurements are given in the fourth column differs from others, in having the incisor teeth white; in all other specimens which I have seen, these teeth are of a rich orange colour in front.

[2] From the skull figured and described by M. Van der Hoeven.

CHINCHILLA BREVICAUDATA.

Short-tailed Chinchilla.

Eriomys Chinchilla. LICHT. Darstell. Part 6, Pl. 28.
" " WAGNER, Schreb. Säugth. Suppl. iii. p. 302.
" " Of the Leyden Museum.

Ears oblong, rounded at the extremities; fur on the back about an inch and a quarter in length; of a deep blue-grey at the root; and, on the upper parts, each hair has a broad white ring near the point, and is dark grey at the point: the general tint silvery grey, suffused with black, especially on the back; under parts of the body, inner surface of the limbs, and the feet, white; tail with two dark bands on the upper surface.

Inhabits Peru.

The above is extracted from Dr. Wagner's description of the *Eriomys Chinchilla* of the Berlin Museum. The admeasurements of this animal, as given by the same author, are as follows:—

	From Wagner.		Leyden Museum.		Leyden Museum.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length of the body	14	0	14	0	15	0
" of tail, without the hair	3	0				
" of ditto, including the hair ...	5	6	5	6	5	0
Length of the ear	1	6	1	8	1	7
Width of ditto			1	7	1	6
Length of the hind foot	2	6	2	7	2	6½

On my visit to the museum at Leyden during the last autumn, I made a note, to the effect that two Chinchillas in that museum appeared to me to be decidedly larger, and to have the ears and tail relatively shorter than the Chinchillas

in our English collections: that such is actually the case, will be seen upon comparing the admeasurements which I have arranged with those given by Dr. Wagner, with the admeasurements of the *Chinchilla lanigera*, and moreover it will be evident that the two specimens in question agree most closely in size and proportions with Lichtenstein's animal. Their colouring, moreover, is essentially the same; the general hue of the upper parts of these specimens being (according to my note) of a very pale bluish grey, but mottled with slaty-black; the under parts, as well as the feet, white. Tail becoming gradually more bushy to the end; the hairs greyish white, and grey-black, in about equal proportions. Fur on the back grey, and each hair with a broad subterminal white ring, and a grey-black point.

I feel little doubt that further investigation will prove this to be a distinct species from the *Chinchilla lanigera*. Wiegmann and Dr. Wagner have arrived at the same conclusion.

SUB-FAMILY, OCTODONTINA.

Octodontidæ. WATERH., in the Zoology of the Voyage of H.M.S. Beagle, Mammalia, p. 83 (1839); Proc. Zool. Soc. for Nov. 1839, Pt. 7, p. 172.

Psammoryctina (part). WAGNER, Schreb. Säugth. Suppl. iii. p. 312; Wiegm. Archiv. vii. 1841.

Hystricina with rootless molar teeth, having but a single indenting fold of enamel on either side, or, rarely, with an extra fold on the inner side of the molars of the lower jaw: zygomatic arch with an angular process on the lower edge: hind feet with five toes; fore feet likewise with five toes, or, sometimes, with four.

The species of this section inhabit the middle and southern parts of South America, occurring on both sides of the Andes:

they are of small size, the largest known species scarcely surpassing the Common Squirrel in bulk: some live almost entirely under ground, and have the fore feet strong, and armed with powerful claws, fitted to their burrowing habits; others are found at the roots of hedges, occasionally climbing amongst the branches of the shrubs of which the hedges are formed, or even (though rarely, I suspect) ascending trees.

The *Octodontina* bear the same kind of relationship to the *Echimyina*, as do the *Arvicolina*, of the Northern Hemisphere, to the true Rats; they agree with the *Echimyina*, in fact, in all essential points, but differ in having the molar teeth rootless, and almost always of a more simple structure. Accompanying the rootless molar teeth, we find that the incisors are almost always broader, and relatively less deep, from front to back; and connected with these differences, the structure of the skull denotes increased powers in the muscles of mastication, the zygomatic arch being stronger, and the temporal fossæ more extended: generally, in proportion as the incisor teeth increase in size, the cranium assumes a broader and shorter form, is more contracted between the orbits, and has the cerebral cavity proportionately smaller[1]; and it is in those species which burrow, and live almost entirely under ground, that these last mentioned peculiarities are carried to the extreme.

From the other two sub-families of *Hystricidæ* which are characterized by rootless molar teeth—the *Caviina* and *Chinchillina*—the Octodons may be distinguished by the hind feet being always provided with five well-developed toes: the

[1] The same kind of differences are observable in the skulls of the *Arvicolæ*, when compared with those of the true Rats; but in each group the general type remains evident amidst all the various modifications: hence, as the skull of an *Echimys* may be distinguished from that of the true Rat, amongst other characters, by the greater depth of the zygoma, and the superior breadth of the frontal bones between the orbits, so are the Octodons' skulls distinguished from those of *Arvicolæ* by similar differences.

presence of a distinct tail will prevent the Octodons from being confounded with the Cavies; and this organ being clothed with short hairs in the Octodons gives to these animals a very different aspect to that of the bushy-tailed Chinchillas. The skull and dentition likewise furnish good distinguishing characters. The palate—as will be seen upon comparing the figures on Plate 8 with those of the skulls of Cavies and Chinchillas—is less contracted between the foremost molar teeth: the malar bone has a distinct angular projection on its under side, as in the *Echimyina*[1] (*a* fig. 3, Pl. 12), and there is the same strong muscular ridge running obliquely forwards and downwards from the hinder root of the zygoma on the outer surface of the malar bone. The molar teeth are usually indented on each side by a single fold of enamel, and the crown of one of these teeth approaches more or less nearly to the form of the figure 8: the most marked exception is found in the lower molars of the genus *Habrocoma*—Pl. 8, fig. 1.

Five genera, having well-marked distinguishing characters, are included in the present sub-family: their chief external peculiarities are as follows:—

I. Fore feet with four toes; ears very large ... ... *Habrocoma.*
II. Fore feet with five toes.
  A, Ears large or of moderate size.
    a, tail as long as the body; slightly bushy at the extremity ... ... *Octodon.*
    b, tail shorter than the body; clothed throughout with small adpressed hairs ... ... *Schizodon.*
  B, Ears very small, almost entirely hidden by the fur of the head.
    a, incisor teeth moderately broad; nails to the toes of the fore feet shorter than the toes ... *Spalacopus*
    b, incisor teeth very broad; nails to the toes of the fore feet longer than the toes ... ... *Ctenomys.*

[1] This angular process is very large in the species of Ctenomys, but unfortunately was broken off in the skull—fig. 5, Pl. 8.

The skull of the species of *Octodon* and *Schizodon* differs from that of other species of the present sub-family, in having a separate groove for the infra-orbital nerve; a small vertical plate, rising from the anterior root of the zygoma above, forms the outer boundary of this groove.

Genus, *Habrocoma*[1].

Abrocoma. Waterh., Proceedings of the Zoological Society for February, 1837, p. 30; Zool. of H.M.S. Beagle, Mammalia, p. 83.

Octodontina with the incisor teeth very narrow; the upper molar teeth with a deeply indenting fold of enamel on either side dividing each tooth into two equal, transverse lobes; the hindermost molar with an extra small lobe behind; lower molars, each with a single fold on the outer side, and two folds on the inner side; all the folds of enamel deep, and running obliquely forwards; the lobes of the teeth narrow, terminating externally in very acute angles; ears very large; feet naked beneath, and with the soles covered with small fleshy tubercles; the nails small; fore feet without any inner toe: tail moderate, clothed throughout with small adpressed hairs.

Inhabit Chile.

In the large size of the ears, and in having long and extremely soft fur, the species of the genus *Habrocoma* evince an approach to the Chinchillas. The skull likewise presents some points of resemblance in the two groups; as, for instance, in the general weakness of the bones, the large size of the auditory bullæ[2], the narrowness of the basi-occipital bone, and of the bodies of the sphenoids; in the compressed, and somewhat elongated form of the nasal portion of the cranium, and the large size of the orbits: the incisor teeth, likewise, are very narrow in both groups. The form of the

[1] From Ἁβρος, soft; and Κομη, hair.

[2] In Habrocoma, as in *Chinchilla*, the petro-tympanic bulb is visible on the upper surface of the cranium.

zygomatic arch, and that of the lower jaw, as well as the structure of the molar teeth, on the other hand, present strong points of distinction, when these parts in *Habrocoma* and *Chinchilla* are compared. The zygomatic arch in the Octodons, generally, is thrown out more boldly at its anterior root, than in the Chinchillas and Cavies, and, in this respect, *Habrocoma* is the furthest removed from the last mentioned sections: here, the skull, measured at the fore part of the zygomatic arches, is as broad as at the hinder root of those arches; the malar bone sends down, from its under surface, a large and distinct angular process, and there is a post-orbital process on the upper edge. The palatal portion of the cranium in *Habrocoma* differs from that in the other genera of *Octodontina*, in being perfectly smooth, though strongly concave in the transverse direction, and in having a single, tolerably large opening opposite the second molar tooth; the incisive foramina are relatively larger, and more elongated. The rami of the lower jaw present a distinct longitudinal groove on the under surface, separating the dental from the angular portion, as in the other sections of the *Octodontina*, and in this respect differing from the Chinchillas,—but this groove is deeper than usual. The fore part of the jaw is elongated and very narrow, and the condyloid, and angular process, are much elongated; a deep, and very nearly semicircular emargination, separates the two portions behind; the angular portion of the jaw, moreover, presents a very narrow surface when viewed from beneath, and the angular projection on the inner edge[1] is very slightly marked, as is the case in the Chinchillas.

The upper molar teeth may be described as being composed each of two transverse lobes, which are joined in the middle of the tooth by a narrow ridge, formed by the uniting of the external with the internal indenting fold of enamel; the

[1] Corresponding to the part marked *a* in fig. 4, Pl. 12.

inner fold runs inwards, and slightly backwards: the last molar has an extra lobe, projecting backwards, and slightly outwards from the back of the tooth. The lower molars much resemble the grinding teeth in the Arvicolæ, and they will likewise bear a close comparison with the lower molars in Capromys; the loops of enamel are narrow and deep, those which enter from the outer surface of the teeth meeting those which enter from the opposite side; each tooth has a single fold, or loop, on the outer side, and two folds on the inner side; in fact, resembling the teeth, fig. *b*, Pl. 12, excepting that the folds of enamel are rather more oblique, and the lobes of the teeth terminate in very acute angles: and, moreover, the interspaces are not filled with cement, as in the teeth of Capromys. The feet are rather small; the toes short, the nails weak, and hollow beneath; the nail on the second toe of the hind foot is broader than the other nails, and obliquely truncated at the extremity: the soles of the feet are naked, but covered with minute fleshy tubercles, as are also the whole under parts of the toes: the fore feet are remarkable for not exhibiting, externally, even a rudiment of a thumb: rigid hairs cover the nails of the three middle toes of the hind feet.

The skeleton of *Habrocoma Bennettii* is remarkable for possessing a greater number of ribs, and consequently of dorsal vertebræ, than has been observed in any other Rodent[1], there being no less than seventeen pairs of ribs, the hindermost of which are nearly an inch in length: the lumbar vertebræ are five in number, and there are four anchylosed sacral vertebræ, two of which only join the ilium; of caudal vertebræ there are about twenty-three[2].

[1] In the Capromys and Prehensile-tailed Porcupine we find the nearest approach to this number of ribs, there being sixteen pairs in these animals.

[2] This is three more than exists in the skeleton before me, which has evidently lost about that number of vertebræ. I may here mention, that I have examined the skeletons of four out of the five genera contained in the section

The intestines were remarkably long in a specimen of *Habrocoma Cuvieri*, which I dissected; the small intestines measuring full five feet in length, and the large intestines, the diameter of which was distinctly greater than that of the small, measuring three feet: the cæcum was very voluminous, and measured eight inches in length.

HABROCOMA BENNETTII.

Bennett's Habrocoma.

(*Plate* 7, fig. 2).

Abrocoma Bennettii. WATERH., Proceedings of the Zool. Soc. for February, 1837, p. 31; Zool. of H.M.S. Beagle—Mammalia, p. 85, Pl. 28.

Habrocoma helvina. WAGNER, in Wiegmann's Archiv. für Naturgesch. 1842, p. 7.

Ears but little shorter than the head; tail shorter than the body: fur long, and extremely soft; its general hue ashy grey, slightly tinted with yellow; abdomen pale dirty yellow; feet white; tail, pale grey above, grey-white beneath.

Inhabits Chile.

Octodontina, and that I do not find any increase above the ordinary number of thirteen dorsal vertebræ in the genera *Octodon*, *Spalacopus*, and *Ctenomys*. In all, there are well-developed clavicles; the scapula has the spine very deeply emarginated in front: in fact, the spine of the scapula in these animals rises only in the form of a compressed process, of but little antero-posterior diameter, on the hinder half of the scapula, and thence sends forwards a long acromion process, which projects over the articular cavity, and is more or less expanded, and bifurcated, at the extremity: the coracoid process is well developed. The humerus in all has a strong deltoid process; the femur in *Habrocoma*, *Octodon*, and *Ctenomys*, has a slight trace of a third trochanter, represented by a ridge projecting on the outer side of the shaft about midway between the extremities (or rather above that point), and forming an obtuse angle: it is the least prominent in *Ctenomys*, and in *Spalacopus* can scarcely be traced: the tibia and fibula are distinct bones in *all* the genera of the *Octodontina*, for this part of the skeleton I have examined in *Schizodon* as well as the other genera mentioned. The spine of the second dorsal vertebra is stronger and more elevated than the spines of the other vertebræ, and is laterally expanded at the extremity, or even slightly bifurcated, as is the case in the spine in Habrocoma: this spine is very large and broad in *Ctenomys*. In Habrocoma all that exists of the thumb is a short metatarsal bone.

This animal was discovered by Mr. Darwin amongst some thickets in a valley on the banks of the Cordillera, near Aconcagua, and that gentleman informs us that he saw two specimens of the same animal, on the elevated plain, near the town of Santa Rosa, in front of the same part of the Andes: they were crawling up the trunk of an Acacia tree with so much facility as to induce the belief that they habitually ascended trees. More recently, numerous specimens of the *Habrocoma Bennettii* have been sent to England by Mr. Bridges from Chile, from which I perceive that the animal sometimes attains a larger size than the individual described by me in the "Voyage of the Beagle," and, as might be expected, the different specimens exhibit some slight variations in their colouring.

The *Habrocoma Bennettii* is somewhat larger than the Common Rat (*Mus decumanus*), has much larger ears, and these are nearly round, if we except the hinder edge, which is straight in the middle portion: the tail, in length, is about equal to half that of the head and body, and rather thick at the base; it is densely clothed throughout with short hairs, averaging about one-eighth of an inch in length. The fur of the animal is long, and remarkably soft; the long hairs, which are very abundant, are extremely slender. The general hue of the fur is ashy grey, with a slight admixture of yellow, and sometimes having a faint brownish hue on the back; the hairs on all parts of the body are of a deep slate-grey below the exposed ends; those on the back have the exposed end chiefly of a pale, impure ochreous yellow tint, but with the point dusky: on the sides of the body the hairs differ from those of the back in wanting the dusky point, and in having the yellowish tint very pale; on the abdomen the points of the hairs are white, more or less suffused with pale dirty yellow or cream-colour, especially in the mesial line. The feet are white; the tail pale ashy grey above; the hairs brown, dark at the root, and dirty white beneath. The hairs

of the moustaches are very numerous, slender, and of moderate length; some of them dusky, and others silvery white. The ears are sparingly clothed; the incisor teeth yellow, or pale orange colour in front.

	No. 1[1].		No. 2.		No. 3.		No. 4.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length from tip of nose to root of tail	9	6	9	9	10	0	8	9
" from nose to ear	1	9	1	11	1	10	1	8
" of ear				10		11		11
Width of ditto			1	0½	1	2	1	3
Length of fore foot and nails ...		8		9		9½		9½
" of hind foot and nails ...	1	2½	1	4	1	5	1	4⅓
" of tail	5	0	5	0	5	9	5	0
Diameter of ditto at the base ...						4		4½
Length of skull	2	0½						
Width of ditto	1	0						
Length of nasal bones		9¼						
Width of ditto behind		2¼						
" in front		2⅝						
" of interorbital space ...		4¼						
From incisor teeth to molars ...		7½						
Width of incisors		1½						
Length of four upper molars, taken together ...		5¼						
Space between the foremost molars		1						
" between the last pair ...		2¼						
Antero-posterior diameter of auditory bullæ		7¼						
Transverse diameter of ditto ...		5½						
Length of lower jaw	1	6¼						
" of angular portion of ditto		9¼						
Height of lower jaw, measuring from the condyle ...		7⅜						

[1] The dimensions in column No. 1 are from a stuffed specimen; those in column No. 2 are from the specimen described in the Zoology of the Beagle, and those in column No. 3 are from a specimen in the British Museum, which is more suffused with brown than usual, and has the cheeks and sides of the body distinctly tinted with pale rufous: in column No. 4 are the admeasurements of a male specimen preserved in spirits.

HABROCOMA CUVIERI.

Cuvier's Habrocoma.

Abrocoma Cuvieri. WATERH., *Proceedings of the Zoological Society for February*, 1837, p. 32; Zool. of H.M.S. Beagle—Mammalia, p. 86, Pl. 29.

Ears slightly emarginated behind; tail for the most part black: general hue of the animal ashy grey; abdomen whitish, or tinted with cream colour.

Inhabits Chile—near Valparaiso.

I gave the name *Cuvieri* to two specimens of a small Habrocoma forming part of Mr. Darwin's collection, relating to which that gentleman's note states—"This species is abundant on the dry hills, partly covered with bushes, near Valparaiso."

These two specimens are very much smaller than the specimens of *Habrocoma* named *Bennettii*—indeed their bulk is scarcely more than one-third of that of the individuals last mentioned; they both have the ears slightly emarginated behind, and the tail entirely of a dusky black colour, with the exception of the under part of the basal portion, which is pale. With regard to their small size, it is necessary to observe that the skull, which has been removed from one of them, shews that the animal was not adult, since the hindermost molar in each jaw is scarcely protruded from its socket: the three developed molars are very much smaller than the corresponding teeth in the *H. Bennettii*; they occupy, in fact, the same space, in the longitudinal direction, as is occupied by the two foremost molars in the larger ani-

mals[1]; the skull is relatively shorter, and the hinder portion is more arched.

	Inches.	Lines.
Length from nose to root of tail	6	2
" from ditto to ear	1	4½
" of ear		7
Width of ditto		7
Length of fore foot and nails		7
" of hind foot and nails	1	0½
" of tail	3	0
" of skull	1	4¾
Width of ditto		9
Length of nasal bones		6¼
Width of ditto behind		2
" in front		2
From incisor teeth to molars		4½
Length of three foremost molars, taken together		2¼
" of the four molars, about		3¾
Antero-posterior diameter of auditory bullæ		6
Length of lower jaw		11½
" of angular portion		5½
Height of lower jaw, measured from the condyle		4¼

Genus, *Octodon*.

Octodon. BENNETT, Proceedings of the Zool. Soc. for March, 1832, p. 46; Trans. Zool. Soc. vol. ii. p. 81.

Dendrobius. MEYEN, Nova Acta Acad. Nat. Cur. xvi. p. 600. 1833.

Octodontina with moderately large ears; tail nearly as long as the body, with long hairs at, and near the point; five toes to the fore or hind feet; the claws small: incisor teeth moderate as to width, or somewhat narrow; convex in front:

[1] I have before me the skull of a young Coypu (*Myopotamus Coypus*) in which the molar teeth are in precisely the same condition as in the *Habr. Cuvieri*, and, upon comparing the three foremost molars of this skull with the same teeth in an adult animal, I find they measure a trifle more in the longitudinal direction in the young than in the old animal, where each tooth has been slightly worn by the friction of the adjoining tooth or teeth.

molar teeth each with a single indenting fold of enamel on either side; the hinder half of the upper molars much narrower than the anterior portion: a small vertical plate (to protect the infra-orbital nerve) within the ant-orbital opening of the skull.

The species of this genus inhabit Chile and the Bolivian Andes, and extend into Peru; they are readily distinguished from the members of the other genera of the *Octodontina* by their tail being tufted at the extremity; on the basal portion of the tail the hairs are very short, and somewhat scanty, only partially hiding the scaly skin from which they spring; about the middle of the tail they begin to increase in length, and those which spring from the point are the longest. The molar teeth of the lower jaw are indented on either side by a tolerably deep fold of enamel; the folds of the opposite sides, however, do not meet in the middle of the tooth: in form, the crown of one of these teeth nearly resembles the figure 8, but each lobe of the tooth is broader than long, and is placed obliquely with respect to the jaw—see Plate 8, figs. 2 and 3. The upper molars differ from the lower (as will be seen in the figures just referred to) in having the hinder lobe much narrower, in the transverse direction, than the front lobe.

OCTODON DEGUS.

Cuming's Octodon.

(*Plate* 11, fig. 2).

Sciurus Degus.	**Molina**, Saggio sulla Storia Naturale del Chile, 4to. ed. p. 251 (1810); 8vo. ed. 1782, pp. 303 and 342.
" "	**Gmel.** Linn. Syst. i. p. 152.
Octodon Cumingii.	**Bennett**, Proc. of the Zool. Soc. for March, 1832, Pt. 2, p. 47; Trans. Zool. Soc. vol. ii. p. 81, Pl. 16.
" "	**Wagner**, Schreb. Säugth. Suppl. iii. p. 317.

Octodon pallidus.	WAGNER, in Wiegm. Archiv. 1845, Pt. 3, p. 33.
? *Cumingii.*	TSCHUDI, Fauna Peruana, Säugth., Pt. 14, p. 171, Pl. 12.
Dendrobius Degus.	MEYEN, Acta Acad. Nat. Cur. xvi. p. 601, Pl. 44, (1833).
Chilian Squirrel.	SHAW, Gen. Zool. ii. p. 148.

Fur long, and moderately soft; upper parts of the body pencilled with black and pale brownish yellow; sides of the body chiefly of the latter colour; abdomen dirty yellow; feet white, faintly tinted with yellow; tail dusky above, dirty white beneath; the long hairs on the apical third, black, or dusky.

Inhabits Chile.

According to Mr. Darwin, this species of Octodon may be seen by hundreds in the hedgerows and thickets in the central parts of Chile, where they make burrows close together, leading one into another. They feed by day in a fearless manner, and are very destructive to fields of young corn; when disturbed, they all run together towards their burrows, in the same manner that Rabbits in England do when feeding outside a covert. When running they carry their tails elevated; and often they may be seen seated on their haunches, like the Squirrel. According to Molina, they lay up a store of food for the winter, and do not become dormant. According to more than one author, the Octodon is seen occasionally to climb amongst the branches of the bushes. Mr. Bridges informs us[1] that Cuming's Octodon has a very extended range, that gentleman having met with it as far north as lat. 28°, and southwards to the 35th parallel. In the province of Coquimbo, where the country is sterile, the little animal takes up its abode amongst the loose stones on the sides of the mountains, and is frequently met with in the holes of the Chinchillas. Its food consists of the herbage

[1] See Proceedings of the Zoological Society for 1843, p. 130.

which grows at the roots of the hedges; in the winter months, when pressed by hunger, it feeds upon the tender bark of the *Mimosa Cavenia*, and also on that of the *Cestrum Palqui*. Mr. Bridges is inclined to believe that it breeds but twice in the year, and states that it has from four to six young at a birth.

The *Octodon Cumingii* is rather smaller than the Common Water-Rat, has moderately large ears, which are distinctly emarginated behind, and the tail rather shorter than the body. Its long and soft fur is of a very deep grey colour next the skin, indeed almost black, but, on the upper parts of the body, the hairs are rather broadly annulated towards the point with pale brownish yellow, and at the point they are dusky: numerous long hairs are interspersed with those of the ordinary fur; the visible portion of those which spring from the back are black, whilst those on the haunches are white at the extremity. On the sides of the body these hairs differ from those of the back in being almost destitute of any dusky hue at the point, and here, therefore, the prevailing tint is brownish yellow: the hairs of the abdomen are of a pale yellow colour at the point. The feet are almost white, and so is the under surface of the tail, as well as the sides, the upper parts being dusky, with a very slight pencilling of yellow; the apical third of the tail is clothed with coarsish black, or dusky hairs, averaging about half an inch in length. The skin of the ears is apparently black; they are rather sparingly clothed for the most part with small pale hairs; those on the fore part of the outer surface, however, are of a dusky hue; the orbit of the eye is pale yellow, and there is a pale spot behind each ear. The hairs of the moustaches are very numerous, and somewhat slender; some of them are black, others are white, and some few are black at the base, and white beyond. The nails of the toes are black; the naked soles of the feet are apparently also black; they are covered with minute tubercles;

besides which there are the ordinary fleshy pads at the base of the toes, and on the summit of each of these is a tubercle of larger size than elsewhere: on the under surface of the toes are several transverse incisions. The inner toe of the fore foot is very small, and has a short and blunt nail; the small nails of the other toes are compressed, curved, sharply pointed, and hollow beneath: long and stiff white hairs project over the nails of the hind feet. The female Octodon has eight mammæ; the three anterior pairs of which are remarkable for their position, being almost on the sides of the body[1].

	From stuffed specimen.		From stuffed specimen.		From specimen preserved in spirit. Female.		*O. pallidus.* Pale variety.		From Tschudi.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length from tip of nose to root of tail	8	0	7	6	7	6	7	6	7	3
" of tail, not including the hair	4	2	4	4	4	8	3	10	4	3[2]
" from nose to ear	1	$8\frac{1}{4}$	1	7	1	6	1	6	1	6
" of fore foot and nails		$8\frac{3}{4}$		$8\frac{1}{2}$		$9\frac{3}{8}$		$8\frac{3}{4}$		9
" of hind foot and nails ..	1	$4\frac{1}{4}$	1	6	1	6	1	5	1	3
" of ear		$8\frac{1}{2}$		$8\frac{3}{4}$		8		7		9
Width of ditto ...				11	1	0		$9\frac{1}{2}$		

[1] I have found mammæ similarly placed in the Viscacha and Coypu. The foremost nipple on either side of the body, in the Octodon, is placed on a line with the base of the fore leg, and is about half an inch behind the limb; the third nipple is placed close in front of the femur, and the second is found midway between these two; the remaining two nipples are placed between the hind legs.

[2] Including the tuft.

Octodon Cumingii, var. Peruana. TSCHUDI.

Dr. Tschudi regards as a variety of Cuming's Octodon, an animal which he found in Peru, but in one spot only, namely—"in the Quebrada of San Mateo, in the neighbourhood of the village of San Juan de Matucanas, at an elevation of about 9000 feet above the sea[1]." Its general hue is stated to be of a yellowish grey-brown on the upper parts of the body, but with pencillings of black; the hairs, however, are of a dark slate-grey colour at the root: the under parts yellowish white; the head and neck suffused with rufous, and with less admixture of black than on the back; the region of the ear yellowish white, which colour is expanded into a tolerably large patch near the posterior angle of the ear; the feet dirty white; nails blackish brown; tail blackish brown at the base above; the tuft at the apex black, passing into red-brown; the hairs of the moustaches are some of them entirely black, others silvery white, and some of them black at the root and white at the point: the ears blackish grey, and clothed with short hairs, of which those on the anterior margin are white. Long and coarsish hairs are interspersed with those of the ordinary fur; those on the back are black, whilst those on the sides of the body, and near the root of the tail, are white. The dimensions of the animal are given with those of the *Octodon Degus*, in the fourth column. Dr. Tschudi, who has compared his Octodon with the specimen in the Berlin Museum, which is the original of Meyen's description under the name *Dendrobius Degus*[2], states that it is of a brighter hue, both

[1] I find in the maps that Matucana and San Mateo are situated on the west slope of the Cordillera, very nearly in the latitude of Lima.

[2] Dr. Tschudi states that the length of this specimen is (measured from the tip of the nose to the root of the tail) 7″ 1‴, and not 5½″, as stated by Meyen; and that its hind foot is 1″ 3‴.

on the upper and under parts of the body, than the Chilian animal, and that its abdomen is of a yellow-white colour, and not dingy grey, as in the *Octodon Cumingii* of Mr. Bennett. To this statement I have to remark, that I have seen at least sixty specimens of the *Oct. Cumingii* from Chile, and find that they vary as to the brightness of their colouring, and that the abdomen is almost invariably tinted with yellow. It is to be desired that the skulls of the Peruvian Octodon be compared with that of the Chilian, and likewise with the species which inhabit the high lands of Bolivia.

Octodon pallidus. Wagner.

Three specimens of an Octodon from Chile, contained in the British Museum collection, are undoubtedly identical with the *Octodon pallidus* of Wagner, and, I have little doubt, are simple varieties of the *Oct. Degus*. Mr. Darwin, when in Chile, noticed that piebald, or albino varieties of this little animal, were by no means uncommon, and Mr. Bridges, who has likewise studied these animals in their native country, informed me that the specimens, about to be noticed, were varieties of Cuming's Octodon.

The three specimens in question (and I have seen several others like them) agree with the *Octodon Degus* in the size and proportions of the skull, as well as other parts, but differ in being almost of an uniform pale sienna yellow colour: the abdomen is of a paler hue than the upper parts of the body; and the tail and feet are white, or white slightly tinted with yellow. I shall have to notice similar varieties of several other species of Rodents, as well as of Mammals of other orders: they present a condition which is intermediate between the true albino and the normal state.

OCTODON BRIDGESII.

Bridges' Octodon.

Octodon Bridgesii. WATERH., Proceedings of the Zoological Society for October, 1844, p. 153.

Fur very long, and moderately soft; upper parts of the animal strongly pencilled with brown-yellow, and black,—the black prevailing on the back: abdomen white, suffused with pale brown-yellow, or cream coloured; tail indistinctly tufted; dusky, excepting at the base beneath, where it is dirty white: feet greyish white.

Inhabits Chile—the Province of Colchagua.

This species—which has been named after Mr. Bridges, who has not only enriched our collections with the animals and plants of Chile, but who has likewise furnished us with excellent observations on the habits and ranges of the former[1] —may be distinguished from the *Octodon Degus* by its large size; its tail being relatively longer and less distinctly tufted, and the ears rather smaller. Its general hue, moreover, is darker—somewhat inclining to brown—there being a greater admixture of black on the upper parts of the body, and the hairs being annulated with brownish yellow[2]: there are likewise differences in the skull and dentition, which are hereafter pointed out.

The fur in Mr. Bridges' Octodon is dense, very long, and but moderately soft; the interspersed coarse hairs are very abundant, and their exposed ends are black on the upper

[1] The contents of various letters, which Mr. Bridges has been so kind as to address to me on these subjects, having been communicated to the Zoological Society, will be found in the "Proceedings"—so often quoted in this work.

[2] In colouring, this animal is exceedingly like the Common Rat.

parts of the animal, and white on the sides of the body, as well as over the haunches, where they are very conspicuous. The hairs of the ordinary fur are of a slate-grey colour at the root, and, indeed, for the greater portion of their length; less dark than in *Oct. Degus*, and rather broadly annulated with brownish yellow towards the point, which is black; on the sides of the body the yellow hue prevails, whilst the black is more prominent on the back. The hairs on the under parts of the body are sometimes of a cream-colour at the point, and sometimes a brownish yellow hue is tolerably distinct: the throat, and inner side of the legs at the base is white; the feet greyish white. The tail is dusky black above; below, and at the sides, it is white, or dirty white: the hairs on this organ are rather scanty throughout, and hence do not entirely hide the skin; from the tip of the tail they project about half an inch, or less, and from that point towards the base they gradually decrease in length. The ears are clothed with small hairs, which are pale, excepting on the fore part externally, where they are dusky brown. The hairs of the moustaches resemble those of *Oct. Degus*: the nails of the toes differ in being brown, or horn-colour, and are shorter than in *O. Degus*.

	Zoological Society.		British Museum.		British Museum.	
	Ins.	Lines.	Ins.	Lines	Ins.	Lines.
Length from tip of nose to root of tail ..	8	4	8	3	8	6
" of tail, not including the hair ...	5	2	5	4	5	0
" from nose to ear			1	7	1	6
" of ear		7½		8		7½
Width of ditto				11		10
Length of fore foot and nails		10		10½		10
" of hind foot and nails	1	6	1	7	1	7

The skull of *Octodon Bridgesii* (Pl. 8, fig. 3) differs from

that of *Oct. Degus* (Pl. 8, fig. 2[1]) in being larger, and less arched; somewhat narrower between the orbits; in having the zygoma relatively deeper, and the nasal bones longer and narrower: the palate is rather more contracted between the anterior molar teeth, and more deeply emarginated behind: the basi-occipital bone is broader. The lower jaw is less deeply emarginated behind, and has the coronoid process broader in the antero-posterior direction. The upper molar teeth have the transverse diameter relatively greater, and the indenting fold of enamel on the inner side distinctly deeper; in *O. Degus* the fold on the inner side of the last molar indents the tooth so slightly as merely to produce a waved outline, whilst this same tooth in *O. Bridgesii* has the inner fold of enamel fully as deep as that on the inner side of the foremost molars of *O. Degus*. The molars of the lower jaw, like those of the upper, are proportionately broader.

[1] The lower jaw on this plate, marked 2 *b*, should have been 3 *b*, since it belongs to the *Oct. Bridgesii*, and not to *Oct. Degus*, as is made to appear by the lettering of the plate.

	O. Bridgesii.		*O. Bridgesii.*		*O. Bridgesii.*		*O. Degus.*		*O. Degus.*		*O. Degus.*		*O. Degus.* Var. *pallidus*	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Total length of skull ...	1	9½	1	9¾	1	10¼	1	6	1	7	1	6¼		[1]
Width ...	1	0½		11⅓		11⅔		10½		10¾		10⅔		10⅔
" between orbits ...				4⅓		4¼		4½		4$\frac{2}{7}$		4¾		4⅔
Length of nasal bones ...		8½		8½		8½		7		7		7		7½
" of zygomatic arch ...		11		10½		10½		8½		9		8¾		9
From incisors to molar teeth ...		5¼		5		4⅘		4¼		4½		4⅓		4½
Width of palate between the last molars ...		2⅔		2⅙		2¼		2		2⅛		2⅕		2¼
Length of four upper molars, taken together ...		5¼		5		5⅕		4⅓		4½		4⅓		4½
Width of incisors ...		1¾		1¾		1¾		1⅗		1⅓		1½		1⅓
Length of the lower jaw, measured from the hinder part of condyle ...	1	2¼	1	2	1	2		11⅔	1	0½			1	0½
Height of ditto ...		7				6½		5⅔		5¼				6

[1] The hinder portion of this skull is wanting, but measuring to the extremity of the posteriorly produced portion of the temporal bone, the length is 1″ 5‴; the skull, of which dimensions are given in the sixth column, gives the same length when measured in the same manner. Having now examined many specimens of *Oct. Bridgesii*, and the skulls of four specimens, and finding them always to differ from *O. Degus* in the points mentioned, I am perfectly satisfied that they form two distinct species.

OCTODON GLIROIDES.

Dormouse Octodon.

Octodon Gliroides. D'Orbigny et Gervais, Revue Zoologique, Année 1844, vol. vii. p. 123; D'Orbigny's *Voyage dans l'Amérique.*

Fur soft, ashy grey on the upper parts of the body, and white on the under; tail, brown-black beneath to the extremity, which is somewhat tufted; feet, white above.

The animal upon which Messrs. D'Orbigny and Gervais found the *Octodon gliroides*, is said to inhabit the summit of the Bolivian Andes at La Paz, where it feeds upon the Cactus plants. Its proportions are said to be nearly the same as in *O. Degus*, but, besides the dissimilarity of colouring in the two animals, the *Oct. gliroides* differs from *O. Degus* in having the molar teeth rather less elongated; the fourth molar has the folds of enamel less oblique; the upper molars are of a more triangular form, and the lower more regularly 8-shaped, with the exception of the hindermost, which is of the form of a comma, and has the indenting fold on the outer side, and not on the inner, as in *O. Cumingii*. In the last mentioned species, the last molar of either jaw differs less from the preceding molars, both in size and form, than do the same teeth in *O. Degus*.

The above is extracted from the description given by Messrs. D'Orbigny and Gervais: I am unacquainted with the animal.

Genus, *Schizodon*[1].

Schizodon. Waterh., *Proceedings of the Zoological Society for November*, 1841, p. 91.

[1] *From σχίζω, to cut, divide; and ὀδοὺς, a tooth.*

Octodontina with moderate sized ears; short tail, clothed throughout with short hairs; fore feet strong, the claws about equal to the toes in length: incisor teeth stout; molars each with a single deep fold of enamel on either side, dividing the tooth into two oval-shaped lobes, the long diameters of which are placed transversely; the lobes equal in size, or very nearly so, excepting in the hindermost molar of each jaw, in which the posterior lobe is considerably smaller than the rest: skull strong, rather short and broad, with a separate small canal for the infra-orbital nerve. Toes 5—5.

Inhabits the Southern Andes—eastern side.

The genus *Schizodon* in many respects is intermediate between the genera *Octodon*, *Ctenomys*, and *Spalacopus*; in its dentition it differs from either, but, on the whole, approaches most nearly to the last-mentioned genus. To the naked eye, the series of molars appear to be made up of a succession of cylinders, compressed from before backwards, and these scarcely presenting any difference in size in the three foremost molars in each jaw; but under a lens, each molar is seen to have a deep external, and a correspondingly deep internal, fold of enamel; the folds of opposite sides meeting in the mesial line of the tooth. In the upper jaw the hindermost molar is somewhat smaller than either of the three preceding teeth, and has the posterior lobe smaller than the anterior one; in the lower jaw the corresponding tooth is of the same form, but is of smaller size, and it is so placed that the inner side of the tooth inclines inwards and forwards. Beyond these points, I have only to remark, that each lobe of the molars is slightly angular, both on the outer and inner sides of the tooth. Compared with the molars of *Octodon* and *Ctenomys*, the corresponding teeth in *Schizodon* are at once distinguished by the general equality of the lobes; and from the molars of *Spalacopus* they differ in having the folds of enamel of opposite sides meeting in the middle of

the tooth. The incisor teeth are very large; broader than in the *Octodons*, but with the anterior surface convex, as in the incisors of those animals, and their direction is the same. The skull in *Schizodon* (Pl. 8, fig. 4) agrees with that of the *Octodons* in having a separate, small canal for the infra-orbital nerve; in all other respects it is intermediate between the genera *Octodon* and *Ctenomys*. The lower jaw (Pl. 8, fig. 4 *a*[1]), in having the angular portion thrown very boldly outwards, and in other respects, agrees more nearly with the lower jaw of *Ctenomys* than with that of *Octodon*.

SCHIZODON FUSCUS.

The Brown Schizodon.

(*Plate* 11, fig. 2).

Schizodon fuscus. WATERH., Proceedings of the Zool. Soc. for November, 1841, p. 91.

Fur tolerably long, moderately soft, and somewhat glossy; its general hue deep brown—pencilled black and yellow-brown: abdomen of a pale dirty yellow hue; feet dusky brown.

Mr. Bridges, who discovered this animal, informs me that he met with it in the Valle de las Cuevas, on the eastern side of the Andes, about six leagues from the Volcano of Peteroa (S. lat. about 75°), at an elevation of from five to seven thousand feet. Its favourite abode is stated to be in grassy situations near the mountain streams. In certain parts the ground is completely undermined by the burrows of these little animals, and whilst riding over these, the horses of Mr. Bridges' party frequently plunged into the ground almost up

[1] The molar teeth of the lower jaw are much curved, and in the jaw figured on the Plate, the root of the penultimate molar has protruded slightly through the ramus, as is indicated by the two round, dark spots in the figure.

to the hock. The valleys inhabited by the Schizodon are so elevated that they are covered with snow at least four months during the year, and Mr. Bridges is inclined to believe that, like the Spalacopus, the Schizodon lays up a store of food for the winter season. It is a nocturnal animal, and, it would appear, lives almost entirely under ground.

The general colouring of the *Schizodon fuscus* nearly resembles that of the Common Rat (*Mus decumanus*), but it is somewhat darker, and the fur rather softer, and more glossy: it is of a very dark slate grey next the skin, both on the upper and under parts of the body; on the latter parts, the hairs are of a pale dirty yellow colour (sometimes brown-yellow) at the point, and on the upper parts of the animal they are black at the point, and annulated with yellow-brown towards the point; on the sides of the body the hairs are merely tipped with dusky, and the yellow-brown hue prevails; the long, interspersed, coarser hairs on the back of the animal, have the exposed ends black, but those on the sides of the body have dirty white points, or, some of them, especially those near the tail and over the haunches, are broadly annulated with yellowish white near the point, and black at the point. The ears, which perhaps should be described as rather small, are emarginated behind, and somewhat sparingly clothed with small hairs, which are for the most part of a dirty white colour, but are dusky brown on the fore part of the outer surface. The hairs of the moustaches are, the greater portion of them, dusky at the root, and white beyond: the feet are of a dusky brown hue, but pencilled with grey-white; the long bristly hairs which cover the nails of the three longest toes of the hind feet are white. The tail is tolerably well clothed with very short and stiff hairs; dusky brown, or brown, on the upper surface, and brown beneath—pale near the root.

	Zoological Society. Inches.	Zoological Society. Lines.	Brit. Museum. Inches.	Brit. Museum. Lines.
Length from tip of nose to root of tail	9	0	7	6
" of tail	1	8	2	6
" from nose to ear			1	7
" of ear		5½		6¼
Width of ditto				9½
Length of fore foot and nails ...				9
" of the nail of the middle toe				3¼
" of the hind foot and nails ...	1	5¾	1	3
" of skull	1	10	1	8
Width of ditto	1	0	1	0½
Length of nasal bones		8		7½
Width of ditto behind		2		2
" " in front		3		3
Length of zygomatic arch		10		9¾
Greatest depth of ditto		2½		2½
Width between orbits		4½		4¾
" of palate, between the anterior molars		1		1⅛
" of ditto between the posterior molars		2⅔		2½
From incisors to molar teeth ...		5¼		5¼
Width of incisors		2½		2½
Length of the four molars, taken together		5½		4¾
" of lower jaw	1	5		
Height of ditto		7⅓		

Genus, *Spalacopus*.

Spalocopus. Wagler, in Isis. 1832, p. 1219.
Poephagomys. F. Cuvier, Ann. des Sci. Nat. i. (2d Series), p. 321 (1834).
Psammoryctes. Poeppig, in Wiegm. Archiv für Nat. 1835, i. p. 252.
Psammomys. Poeppig, Reise in Chile, Peru, &c. i. p. 166 (1835).
Bathyergus. Poeppig, in Froriep's Notizen aus dem Gebiete der Natur- und-Heilkunde, xxiii. No. 18, p. 279 (1829).

Octodontina with rudimentary ears; tail short, and clothed with short hairs; the nails of the toes of the fore feet rather shorter than the toes; incisor teeth moderately broad, those of the upper jaw distinctly directed forwards as well as downwards; molar teeth with the crowns shaped like the

figure 8, the anterior and posterior lobes being equal, excepting in the last tooth—the indenting fold of enamel of one side of each tooth not meeting that of the opposite side; hindermost molar in each jaw smaller than the rest, and with the posterior lobe smaller than the anterior one.

Inhabit Chile. Live almost entirely under ground[1].

The very small ear, and the folds of enamel on the opposite sides of the molars being separated from each other in the mesial line of the tooth, distinguishes the genus *Spalacopus* from *Schizodon*: the skull, moreover, in the present genus, is much shorter than in the last-mentioned one; the

[1] Dr. Burmeister doubts the propriety of arranging the present genus in the section *Octodontina*, and has removed it into the group *Cunicularia*, and Dr. Wagner has expressed his approval of this view (see Wiegmann's Archiv, 1845, p. 171); the latter author likewise places the genus *Ctenomys* in the *Cunicularia*. This arrangement involves principles of classification totally at variance with my own, and can only be upheld by the assumption that Rodents, whose structure is modified so as to be fitted for burrowing habits, are *necessarily* allied to each other, since over and above those characters which are most clearly adapted to their mode of life, the *Cunicularia* differ much in the structure of the skull, and other parts of the skeleton, from the *Octodontina*, whilst in all the peculiarities of skull and skeleton, *Spalacopus* and *Ctenomys* essentially agree with Octodon: they are, moreover, linked with Octodon by a recently discovered genus (*Schizodon*), which in most of its characters presents an intermediate condition; and, in connexion with these resemblances between the different minor sections of the *Octodontina*, it is interesting to observe that they are all found together in a quarter of the globe in which the *Cunicularia* do not occur. I have further to remark, that the peculiarities which distinguish *Ctenomys* from *Octodon* are less strongly marked in the smaller species of the former genus than in the larger; that such is the case, so far as the skull and lower jaw are concerned, will be seen upon comparing the skull of *Ctenomys* (fig. 5) with that of the larger species (fig. 6), and with the skull of Octodon (fig. 3); and, lastly, I know that the distinctive characters in question almost disappear in the young *Spalacopus* or *Ctenomys*. Dr. Burmeister's observations upon the classification of the Rodentia, are contained in the "Allgemeine Literatur-zeitung" for August, 1843, p. 552, and I am happy to find that so accurate an observer has arrived at the same *general* views upon this subject as myself. Although Dr. Burmeister's views were published long after my own, they appear to have been in no way influenced by the observations contained in the numerous papers I had written on the subject.

ant-orbital opening is relatively smaller, and there is no separate canal in this opening for the infra-orbital nerve. The upper incisor teeth, upon quitting their sockets, instead of being bent suddenly downwards at a right angle with the plane of the skull, or nearly so, as in other *Octadontina*[1], here, are distinctly directed forwards as well as downwards; they, in fact, in their curve, form a smaller segment of a larger circle than usual; their roots, with their bony covering, diverge much posteriorly, and in their passage backwards they encroach upon the ant-orbital opening, and terminate close to the crown of the third molar tooth, on either side. The lower incisor teeth are very long, running back nearly to the condyle of the jaw. Stiff hairs cover the nails of the toes of the hind feet, less distinctly on the outer and inner toes than on the others. The thumb of the fore foot has a short truncated nail.

SPALACOPUS POEPPIGII.

Poeppig's Spalacopus.

(*Plate* 9, fig. 1).

Spalacopus Poeppigii.	WAGLER, in Isis. 1832, p. 1219.
Poephagomys ater.	F. CUV. Ann. des Sci. Nat. tom. i. (2d Series), p. 321, Pl. 13 (1834).
" "	WATERH. Zool. of H. M. S. *Beagle*, Mammalia, p. 82. 1839.
" "	EDOUX et GERVAIS, Voy. de la Favorite, Zool. i. p. 17, Pl. 7 (1839).
Psammoryctes noctivagus.	POEPPIG, in Wiegm. Archiv, (1835), i. p. 252.
" "	WAGNER, Schreb. Säugth. Suppl. iii. p. 318 (1843).
Psammomys.	POEPPIG, Reise in Chile, Peru, &c. i. p. 166 (1835).
? *Mus cyanus.*	MOLINA, Saggio sulla Storia Naturale del Chile, 4° ed. p. 248; 8° ed. p. 308.

Fur soft, and very glossy; black, with an admixture of purple brown; the brown hue most distinct on the under parts of

[1] With one exception only, found in the *Ctenomys leucodon.*

the animal: incisor teeth pale yellow, or yellow-white in front.

Inhabits Chile.

The *Mus cyanus* of Molina has been noticed in all works upon Mammalia for upwards of sixty years past, but I believe has never been identified with any animal received from Chile by the various Museums of Europe; I feel little doubt, however, that Mr. Bridges is correct in the identification suggested in the following observations, communicated to me in a letter :—

"The *Poephagomys ater*, or *Spalacopus Poeppigii*, is undoubtedly the animal alluded to by Molina under the name *Mus cyanus*[1]; his long description of its habits agrees in most respects with the habits of this little animal; but I have never yet heard it called by the natives 'Guanque:' it is generally known in Chile by the name of Cururo and *Cuyeita;* Guanque is the vernacular name of a species of *Dioscorea* on which the 'Cururo' subsists. Molina is perfectly correct in saying that it stores up a considerable quantity of provisions, which consist of the *Dioscorea*, *Conanthera*, *Ornithoagalum*, *Brodiæa*, and other bulbs and tubers which abound in the country. The poorer class of inhabitants being aware of its habits, sound the caves or burrows, and rob them of their store, which they eat. The jaws of the Cururo are capable of extraordinary expansion, and by this provision of Nature it is enabled to carry bulbs and tubers of a large size to its granary.

[1] Molina describes the colouring of the *Mus cyanus* in the following terms—"*corpore cæruleo, subtus albido.*" It is by no means improbable that the blue gloss which a fur of the same texture and colour as that of the Spalacopus presents, when viewed in a strong light, may have given rise to the use of one of these terms; but, upon the supposition that the Spalacopus is identical with *Mus cyanus*, we must further take for granted that Molina had a white-bellied variety of the animal before him, or that his description in this, as in many other cases, is incorrect.

"The work of this little animal would surprise a person unacquainted with its habits: I have frequently seen a considerable surface of ground completely undermined by its burrows. It generally selects the slopes of hills and mountains, where bulbs are found, especially in the interior parts of the country: its caves are carried in a horizontal course, at the depth of eight or ten inches; or rather, about the depth in which they meet their food.

"The Cururo may be considered nocturnal, since it seldom, if ever, makes its appearance during the day; those which I procured were obtained by waiting for them in the evening, and shooting them when their head scarcely emerged from their caves."

With regard to the specific characters of this animal I need add very little to the few lines with which this account commences. The fur is slightly grey next the skin, most distinctly so on the abdomen: the general hue of the animal is sometimes black brown, sometimes nearly a perfect black, but usually black, with an admixture of purple-brown. The ears are slightly emarginated behind, and tolerably well clothed with black hairs. The fore foot has a fringe of silvery grey hairs on the inner side; the nails of the second and third toes of the hind foot are rather broader than the other nails; the nail of the second toe is the broadest, and is obliquely truncated at the extremity: stiff hairs project over these nails, as in other species of the section *Octodontina*. The hairs of the moustaches are numerous, but by no means strong. The following admeasurements are from stuffed specimens in the British Museum:—

	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length from tip of nose to root of tail ...	6	2	6	0	6	6
" of tail	1	10	1	9	1	10
" from nose to ear	1	3	1	3½	1	3½
" of ear		3		2¾		2¾
" fore foot and nails[1]		10		9		9½
" of hind foot and nails	1	1¾	1	1½	1	1½
Length of skull	1	4½				
Width of ditto		10				

Genus, *Ctenomys*[2].

Ctenomys. De Blainville, Bulletin de la Société Philomatique, for April, 1826, p. 62; Ann. des Sci. Nat. x. p. 97.
" Lesson, Manuel de Mammalogie, p. 252. 1827.
" Wagner, Schreb. Säugth. Suppl. iii. 375.

Octodontina with rudimentary ears; small eyes; short tail; fore feet large and powerful, and armed with nails, which exceed the toes in length; incisor teeth very broad, the upper pair indistinctly convex in front, the lower pair flat at the same part: molars with two unequal lobes; the hindermost molar of each jaw much smaller than the rest, nearly cylindrical: skull very strong, short, and broad; the occipital portion much dilated: no separate canal for the infra-orbital nerve.

Geographical range; from Brazil westwards into Bolivia, and southwards to the Straits of Magalhaen. Live underground.

The enormous size of the incisor teeth, and the unequal lobes of the molars, distinguish this genus from *Spalacopus*;

[1] The nail of the middle toe of the fore foot is from 2¼ to 2½ lines in length in these specimens.

[2] From κτεὶς, a comb; and μῦς, a mouse—having allusion to the comb-like apparatus (formed of stiff bristles), with which the toes of the hind feet are furnished.

the claws of the fore feet, moreover, are relatively larger; they are but little arched, and keeled beneath, excepting at the extremity, the keel or ridge being formed by the sides of the nail being bent inwards, and meeting in the middle line: the thumb nail is tolerably large, and hollow beneath. The nails of the toes of the hind feet are smaller, and nearly straight, and entirely hollow beneath: two rows of exceedingly stiff bristles spring from the ends of the toes, and partly cover the nails; and a fringe of long and tolerably stiff hairs projects from the outer side of the foot. The muscular ridge which crosses the malar bone is here remarkably strong, as are likewise the upper and lower angular processes of this bone, which have before been noticed[1].

CTENOMYS BRASILIENSIS.

Brazilian Ctenomys.

Ctenomys Braziliensis.	De Blainville, in Bulletin de la Société Philomatique for April, 1826, p. 62.
" "	Eydoux et Gervais, Voyage de la Favorite, v. Pl. 8, fig. 2 (skull).
" "	Darwin, Voyage of the Beagle—Mammalia, p. 79.
" "	D'Orbigny, Voy. dans l'Amerique, Pl. 17.
" *torquatus.*	Licht., Darstellung, 6ten Heft, Pl. 31, f. 1.

Fur soft, fine, and rather short; of a deep slate-grey next the skin, and bright rusty brown externally; on the under parts of the animal, however, the hairs are rusty white at the point: the hairs on the feet short and harsh, as well as those

[1] How different is the form of the malar bone in the *Ctenomys* and the Bathyergus, or Cape Mole-Rat! this bone being small and slender in the latter animal, as is almost invariably the case in the Muridæ; and, where exceptions occur, we do not find this part then taking the form which I have pointed out as characteristic of a great mass of the South American Rodents. Another well-marked modification of the malar bone is seen in the Beaver and Squirrels, where it runs up in front to be wedged in between the lachrymal bone and the zygomatic process of the superior maxillary.

of the tail, which latter are of a blackish brown colour: hairs of the moustaches tolerably long.

Inhabits Brazil, Paraguay, La Plata, and Bolivia.

The above specific characters are extracted from M. De Blainville's original description, which is from a specimen procured in Minas Geraes. I cannot doubt that the animal described by Lichtenstein is specifically identical with the *Ctenomys Braziliensis* of De Blainville; and specimens of a species of Ctenomys brought from Bolivia by Mr. Bridges, together with others procured at Maldonado, La Plata, by Mr. Darwin, appear to me to be clearly of the same species.

Ctenomys torquatus, LICHTENSTEIN,

Is described as of a bright yellow-brown colour on the upper parts of the body, passing into dark brown along the mesial line; sides of the head, as well as the whole under parts, dirty white: a white band extends from behind the ear to the throat.

This animal, which, according to Lichtenstein, inhabits the southern provinces of Brazil and the banks of the Uraguay, is supposed to be a distinct species from the *Ct. Braziliensis* of De Blainville, on account of the latter being of smaller size, its having a shorter tail, wanting the comb-like bristles on the fore feet, its uniform colouring, and the want of the band on the neck[1].

[1] I cannot admit that these differences furnish good grounds for separating the two animals. In the first place, there is an evident mistake with regard to the size of the *Ctenomys Braziliensis*: it is true, De Blainville (who does not give dimensions) states that the figures on his plate are of the natural size, but if this be true of the figures of the skull, it cannot be so with the figure of the animal, the head of which, as represented, being one-third smaller than the skull; and it will be seen that on the plate in question, there is a mark intended, apparently, to denote that the figure of the animal is one-third of the natural size. The skull figured agrees most closely in size and proportions

Ctenomys, from Maldonado, La Plata.

General hue bright rufous brown; abdomen of a pale reddish yellow colour; and a band of the same colour passes down to the throat from behind the ear: tail brown above, and white beneath: ears with a narrow fringe of rufous and dusky coloured hairs on the hinder margin: hairs of the moustaches for the most part dirty white, with dirty points: fur of a deep slate-grey at the root.

Ctenomys, from Bolivia,

Differs from the above in having the general hue of the fur paler; on the sides and under parts of the body, of an extremely pale rufous yellow tint; and on the upper parts, pale rufous brown: upper surface of the muzzle dusky; a pale vertical mark on the neck; tail pale dirty yellow, more or less suffused with brown above; the apical half with the hairs longer in the mesial line, both above and below, than elsewhere—sometimes more than a quarter of an inch in length; these hairs are harsh, and form a slight crest on each surface of the tail, and cause the orangan to appear compressed; they are usually white, or nearly so: feet nearly white; nails horn-coloured: fur, both on the upper and under parts of the body, of a very dark slate-grey next the skin.

Mr. Bridges brought to England numerous specimens, from the neighbourhood of the town of Potosi, agreeing with the above description; in the same district, however, were found others in which the colouring was somewhat richer and more nearly agreeing with the animal brought from Maldonado by Mr. Darwin; others, again, with the general hue

with skulls before me, which were removed from specimens of Ctenomys received from Bolivia, and which agree in all essentials with Lichtenstein's animal. With regard to the pale mark on the neck, I may observe, that in some of the specimens last alluded to, the mark is distinct, whilst in others it is so faint that it might be overlooked. In all the species of Ctenomys which I have seen, this mark can be traced more or less distinctly. The bristles of the feet are not unfrequently almost entirely wanting, being very apt, it would appear, to be worn off. The difference in the length of the tail alluded to must be very slight—if there really exists any such difference.

very pale, had the upper surface of the head of a black hue, and the hinder part of the back slightly suffused with dusky; and one was of a brown colour, darker than the rest, and very obscurely tinted with rufous. Having examined skulls removed from specimens exhibiting each of these variations in colouring, I am enabled to state that this part presents no differences which would lead us to suppose there was more than one species amongst the Potosi specimens. The skull (Pl. 8, fig. 6) is from one of these specimens; of three others I have given the admeasurements.

Mr. Bridges informs me this animal is called by the natives "Toco," and "Tofo."

	From Maldonado.		From Bolivia.		From Bolivia.		From Bolivia.		From Bolivia.		*Ct. torquatus.* Lichtenst.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length from tip of nose to root of tail ...	8	2	9	0	9	6	8	3	8	8	9	0
" of tail	2	5	3	0	3	6	2	6	2	6	2	9
" of fore foot, without the nails ...		8		8		8½		8½		8½		
" of ditto, including the nails ...		11½	1	0	1	0¾	1	1½	1	1¼		
" hind foot, not including the nails			1	4½	1	5½	1	4	1	3½	1	3
" of ditto, including the nails ...	1	5	1	7½	1	9	1	6	1	7		

The following account of the habits of the Ctenomys is abstracted from Mr. Darwin's notes published in the "Voyage of the Beagle." The species found in Maldonado is there known by the name Tucotuco, the name being in imitation of the sound the animal emits. It is exceedingly abundant, Mr. Darwin states, in the neighbourhood of Maldonado, but is difficult to be procured, and rarely seen. The Tucotuco lives almost entirely under ground, and prefers a sandy soil with a gentle inclination, but it sometimes frequents damp places, even on the borders of lakes. The burrows are said not to be deep, but of great length. They are seldom open; the earth being thrown up at the mouth into hillocks, not quite so large as those made by the mole. Considerable tracts of country are completely undermined by these animals. They appear to a certain degree to be gregarious, for the man who procured my specimens had caught six together, and he said this was a common occurrence. They are nocturnal in their habits, and their principal food is afforded by the roots of plants, which is the object of their extensive and superficial burrows. Azara states that they lay up magazines of food within their burrows.

The Tucotuco is universally known by a very peculiar noise which it makes when beneath the ground. A person, when he first hears it, is much surprised, for it is not easy to tell whence it comes. The noise consists in a short, but not rough, nasal grunt, which is repeated about four times in quick succession; the first grunt is not so loud, but a little longer and more distinct than the three following: the musical time of the whole is constant, as often as it is uttered.

Of specimens kept in confinement by Mr. Darwin, several were quite tame the first day, neither attempting to bite nor to run away: their movements were slow and clumsy, which apparently arose from the outward action of the hind legs;

and they are quite incapable of jumping even the smallest vertical height[1]. Mr. Darwin was informed that the Tucotuco is often found blind. This gentleman met with indications of the presence of the Ctenomys, or of an animal having similar habits, in several parts south of the Plata; in fact, at Bahia Blanca, Rio Negro, and Cape Negro. At Bahia Blanca (lat. 39°), an animal burrows in the same manner as the *Ct. Braziliensis*, and its noise is of the same general character, but instead of being repeated twice at short intervals, it is single, and is uttered at equal intervals, or in an accelerating order. At Rio Negro (lat. 41°), where burrows were again met with, the noise was likewise heard; here the sound was only repeated twice, instead of three or four times, as with the La Plata animal. The sound, moreover, was louder and more sonorous, and closely resembled that made in cutting down a small tree with an axe.

CTENOMYS BOLIVIENSIS.

Bolivian Ctenomys.

Incisor teeth very broad: fur soft, very glossy, and rather short; its general hue bright rufous brown; upper surface of head and muzzle blackish brown, and the same colour is continued in a broad, but not well defined band, along the back of the neck and on to the fore part of the back; under parts of a bright rusty yellow colour, with the exception of the space between the hind legs, and a large patch covering the fore part of the abdomen, where the hairs are entirely white: tail dark brown above, pale brown beneath: nails of fore feet immensely long.

Inhabits the plains of Santa Cruz de la Sierra.

[1] A specimen brought home in spirits by Mr. Darwin was found by Mr. Reid, who dissected it, to be destitute of a ligamentum teres to the thigh-bone, and hence, it is supposed, arises the awkward movements of the hinder extremities; this ligature, however, is certainly not always absent, since in a skeleton from a Bolivian specimen now before me, the ligamentum teres remains attached to the head of the thigh-bone.

A few specimens of a large species of Ctenomys were procured by Mr. Bridges in the above-mentioned locality, which not only differ in their size and colouring from other specimens of Ctenomys found in the high table lands of Bolivia, but present some strongly marked peculiarities in the structure of the skull, which lead me to believe it will prove a distinct species.

The fur of the animal, unlike that of other species which have come under my notice, is but slightly tinted with grey next the skin on the under parts of the body: on the upper parts the hairs are of the usual dark slate grey at the root. The sides of the body are of a rufous brown; the back is of a darker rufous brown, becoming gradually deeper towards the fore part, where the dark colour is contracted into a band which runs along the neck, and joins the black-brown colour of the upper surface of the head: from behind the ear descends a broad mark of somewhat paler hue than on the sides of the body. The hairs of the moustaches are for the most part dirty white. The feet are sparingly clothed with pale brown hairs; or, at the sides, with whitish hairs. The tail is, as usual, clothed for the most part with very short hairs, but those which spring from the point are comparatively long, being fully half an inch in length; they are of a dirty white colour, as are likewise nearly equally long hairs which spring from the mesial line of the tail both above and below, but on the apical half of the organ only.

The incisor teeth are proportionately broader than in *Ct. Braziliensis;* and the claws of the fore feet longer. The skull is remarkable for the great dilatation of the middle part of the muzzle; has the nasal bones broader at the extremity than those of *Ct. Braziliensis;* the auditory bullæ narrower, and the portion of these bulbs which enters into the plane of the occiput is considerably less extended in the vertical direction. The ridge which traverses the outer surface of the

malar bone is here immensely developed. The molar teeth are broader in proportion to their length; whilst the length of the foremost molar in *Ct. Boliviensis* does not exceed that of the same tooth in *Ct. Braziliensis:* I find the transverse diameter in the former $1\frac{1}{3}$ lines, and the latter $1\frac{1}{2}$ lines. I have examined but one cranium of this species, but though I have seen several skulls (evidently adult) of the *Ct. Braziliensis*, I have found no trace in them of the extraordinarily expanded form of the muzzle which characterizes the skull of *Ct. Boliviensis*.

	Inches.	Lines.
Length from tip of nose to root of tail ...	12	0
" of tail	3	0
" of fore foot, without the nails ...		11
" of ditto, including the nails	1	$5\frac{1}{2}$
" of hind foot, without the nails ..	1	$7\frac{1}{2}$
" of ditto, including the nails	1	11

A Ctenomys in the collection of the British Museum agrees in its general colouring with the large animal just described, excepting in wanting the large white patch on the chest, but is of smaller size; not being larger than a full-grown *Ct. Braziliensis;* its incisor teeth, however, are considerably broader, being $3\frac{1}{2}$ lines in width, whilst in the largest specimens of the last-mentioned species they do not measure more than three lines. These circumstances lead me to believe it is an immature individual of the *Ct. Boliviensis*. This specimen was brought from Bolivia by Mr. Bridges, but I regret I neglected to ascertain from what part[1].

[1] As a circumstance which somewhat militates against the conclusions I have arrived at with regard to the two species of Ctenomys described in the preceding pages, I must mention that the larger species, which I have named *Boliviensis*, is from a part of Bolivia, the Fauna of which is completely Brazilian, and where one might expect to find Geoffroy's species, whilst the Bolivian animal, which I have supposed to be specifically identical with the *Ct. Braziliensis*, is from the high lands—procured, indeed, as Mr. Bridges informs me, " at an elevation of 12,000 feet, in sandy slopes and valleys, at no great distance from water"—a part of Bolivia, where nearly all the mammals are distinct from those of Brazil.

CTENOMYS LEUCODON.

White-toothed Ctenomys.

Incisor teeth white, those of the upper jaw distinctly directed forwards as well as downwards: nails of the toes relatively narrow: fur brown, slightly inclining to grey on the upper parts, and faintly tinted with rufous on the sides of the body: abdomen of a pale dirty rufous tint; muzzle dusky above.

Inhabits Bolivia, in the department of La Paz.

Mr. Bridges procured a large number of specimens of this species from San Andres de Machaca, a little south of the lake of Titicaca: they all agreed in having the incisor teeth white, or yellow white, and in this respect differed from all other specimens of Ctenomys which I had examined, they having the incisors of a deep orange colour in front: a more important point of distinction, however, is found in the direction of these teeth. Whilst in other species of Ctenomys the upper incisors descend somewhat suddenly upon leaving the jaw, in *Ct. leucodon* these teeth are very distinctly directed forwards as well as downwards: in both cases the incisors form a segment of a circle, but in the white-toothed animal, they form a smaller segment of a larger circle than in the other species; they terminate posteriorly, on the outer side of the second molar tooth, whilst in *Ct. Braziliensis* and *Ct. Boliviensis* the incisors terminate on the outer side of the first molar. Another difference, which I find constant in the specimens, is, that the nails of the toes of the fore feet are smaller, and relatively more slender; in *Ct. leucodon* the ridge on the under side of the nails is continued but a little distance from the base, whilst in *Ct. Braziliensis* it terminates a little short of the point of the nail. There was

scarcely any variation in the colouring in the specimens of the White-toothed Ctenomys. The fur, as in *Ct. Braziliensis*, is of a deep slate grey at the root, both on the upper and under parts of the body: its general hue is brown, slightly inclining to grey, on the upper part of the body, and a trifle paler, and with a faint rufous tint on the sides. The tail is greyish brown above, dirty white below, and generally has a slight crest of longer whitish hairs both on the upper and under surface of the apical half. The feet are of a very pale rufous hue, but the fringe of long hairs on the outer side of the hind feet is white.

	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length, from tip of nose to root of tail ...	8	0	8	6	8	0
" of tail	2	4	2	6	2	4
" of fore foot, not including the nails		7½		8		8
" of ditto, including the nails ...		11	1	0		11
" of hind foot, without the nails ...	1	1	1	1	1	1½
" of ditto, including the nails ...	1	4½	1	4	1	4½

In two skulls of this species, which I have had an opportunity of examining, I found a slight sagittal crest formed by the junction of the temporal ridges, which in other species were invariably separated.

CTENOMYS MAGELLANICUS.

Magellanic Ctenomys.

(*Plate* 9, fig. 2.)

Ctenomys Magellanicus. BENNETT, Proceedings of the Zool. Soc. for Dec. 1836, p. 190; Trans. Zool. Soc. vol. ii. p. 84, Plate 17.

General tint of the fur ashy grey, faintly suffused with yellow, and on the back brownish; abdomen pale ochreous yellow; tail very pale brown: the fur is moderately long, very soft, and of a deep slate grey colour at the root.

Inhabits Port Gregory, Strait of Magalhaen.

But one specimen, that I am aware, of the species of Ctenomys which inhabits the southernmost parts of Patagonia, has been brought to Europe—the specimen described by Mr. Bennett, and which was presented by Capt. P. T. King to the Zoological Society. The small size of the skull of this animal, and its proportionate narrowness, quite satisfies me that it is a distinct species[1], as these differences cannot in this case be attributed to immaturity, all the teeth being fully developed. The nails of the toes are smaller than usual in the genus.

	Inches.	Lines.
Length from tip of nose to root of tail ...	8	0
" of tail	2	6
" of fore foot and nails		10⅓
" of the longest nail		2⅔
" of hind foot and nails	1	3½

[1] The skull and lower jaw is represented, of the natural size, on Plate 8, fig. 5.

	Ctenomys Braziliensis. British Museum.		*Ctenomys Braziliensis.* From Geoffroy's Plate.		*Ctenomys Braziliensis.* From Bolivia.								*Ctenomys leucodon.*			
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Total length of skull	2	2½	1	11¼	2	1	2	1	1	11	1	10	2	0	1	10½
Width of occiput	1	6½	1	1¼	1	3	1	3¼	1	2	1	0⅔	1	1⅔	1	1¾
" measured from the outer side of the zygomatic arches	1	7⅔	1	2¼	1	3⅚	1	4¼	1	2⅔	1	1¼	1	4½	1	0¾
" " between orbits		5¾				5½		5⅔		5		4		5		5¼
Length of nasal bones		10				9		8				8¾		8⅓		7¾
Width of ditto behind		1¾				2¼		2⅓		2		2⅓		2		2
" " in front		5				3⅔		3¾		3½		3⅚		4		3¼
Length of zygomatic arch	1	0⅔		11		11⅔		11½		11		10½		11		10¼
Width of muzzle, measured in the middle of the inter-maxillary bones		9		5½		5⅔		5½		5⅕		5⅓		6		5
From incisor teeth to molars		8		6¾		7		6¾		6¼		6⅕		7⅓		7⅓
Width of incisors		3¾		2⅔		3		3		2⅚		2¾		3		3
Length of four upper molars, taken together		6		5		5⅔		5½		5⅕		5		5½		5¼
" of lower jaw, to apex of angular portion ...	1	11	1	7	1	8	1	7	1	6	1	5	1	7½	1	6¼
Height, measuring from condyle to lower edge of angular portion		10¼				9⅓		9		8¼		6				8¼
Greatest expanse of the two rami	2	0½	1	5¼	1	8	1	7½	1	5¾	1	4½	1	8⅙	1	5½

With the exception of the admeasurements in the second and third columns, the above dimensions are from crania contained in the British Museum collection. The skull of the *Ct. Braziliensis*, according to the figure in D'Orbigny's work, measures 1″ 10‴ in length; and (?) 1″ 5‴ in width. The average length of the six skulls of the *Ct. Braziliensis* would be about 1″ 11‴; and the width about 1″ 3‴.

Fossil Octodontina.

Amongst the remains of Mammalia found by Mr. Darwin at Bahia Blanca, are certain fragments which Prof. Owen refers to the genus *Ctenomys:* they consist of a portion of the skull with the first and second molars in situ, and containing the sockets of the last two molars; and a fragment of the lower jaw, with the incisor, and one of the molar teeth. The lower incisor is distinctly narrower than the corresponding tooth in the *Ct. Braziliensis;* whilst Prof. Owen states that the upper molars are rather longer than in that animal, and have the external longitudinal groove deeper. These remains are from Monte Hermoso, and, according to Mr. Darwin, are most probably contemporaneous with the Megatherium, Mylodon, and other extinct Mammals found at Punta Alta (also in Bahia Blanca); they are figured in the Zoology of the Voyage of H.M.S. Beagle — Fossil Mammalia, Pl. 32, fig. 6—11, and described at p. 109.

M. D'Orbigny also figures and describes a fragment of a lower jaw of a species of *Ctenomys* (see Voy dans l'Amer. Merid. Pl. 9, figs. 7 and 8). The fragment, being the fore portion of both rami of the jaw, contains the incisor teeth and first and second molars. M. Laurillard justly remarks with regard to this fossil, that its condition does not permit of any safe conclusions relating to the specific or non-specific identity of the animal with the recent species of the genus.

SUB-FAMILY, ECHIMYINA.

Echymidæ. BONAPARTE, Catalogo Metodico dei Mammiferi Europei, 4°. Milano (1845), p. 5.
Psammoryctina (part). WAGNER, Schreb. Säugth. Supp. iii. p. 312.

Hystricidæ with complicated molar teeth, and these (with one or two exceptions only) rooted; malar bone with a distinct angular process on the lower edge: both fore and hind feet with five toes.

Geographical distribution.—One species of this section is found at the Cape of Good Hope[1], and a second in Western Africa[2]: with these exceptions the group is confined to South America and the West Indian Islands. In South America the species of *Echimyina* are only known to occur in the northern and central portions; Paraguay appears to be their southern limit. On the west side of the Cordilleras none have been found.

Genus, *Capromys.*

Isodon. SAY, in Journ. of the Acad. of Nat. Sciences of Philadelphia, Vol. ii. p. 333 (Nov. 1822).
Capromys. DESMAREST, in Mém. de la Soc. d'Hist. Nat. i. p. 43 (Dec. 1822).

Echimyina with rootless molar teeth; each upper molar with a single deep fold of enamel on the inner side, and two deep folds on the outer; incisor teeth narrow, and convex in front: muffle broad, with a mesial longitudinal groove; upper lip slightly cleft: ears moderate; tail of moderate length, and somewhat sparingly clothed with hairs, which do not hide the scaly skin: feet naked beneath, and covered with small tubercles; nails of the toes large, and much curved: pupil of the eye vertical.

[1] *Petromys typicus.* [2] *Aulacodus Swinderianus.*

But two species of this genus are known; they inhabit the Island of Cuba.

By arranging the present genus at the end of the *Echimyina*, adjoining the Octodon section, its principal characters will be indicated. Thus, the species of Capromys agree with the Octodons in having rootless molars, but these teeth, in their more complicated structure, resemble the molars of the Spiny Rats (*Echimys*); and the more elongated form of the skull is another point which induces me to arrange the genus Capromys in the Echimys' division, with which it is more distinctly connected by other genera, than with the Octodons[1].

CAPROMYS PILORIDES.

The Short-tailed Capromys.

Isodon pilorides.	SAY, Journ. of the Acad. of Nat. Sci. of Philadelphia, vol. ii. p. 333, with Plate (Nov. 1822).
Capromys Fourneiri.	DESMAREST, Mém. de la Soc. d'Hist. Nat. i. p. 43.
" "	RAMON DE LA SAGRA, Hist. Phys. de l'Ile de Cuba, Mammifères, p. 11; Atlas, Plates 3, 4, 6, and 7.
" "	WAGNER, Schreb. Säugth. Suppl. iii. p. 322.

Tail shorter than the body: fur long, very harsh to the touch, strongly pencilled with black and rich yellow; or, on the hinder part of the body, with yellowish rust colour; ears, muzzle, throat, and chest, white, or nearly white; abdomen rusty yellow; toes whitish, or white: tail well clothed at the

[1] It is true that the molar teeth of the lower jaw in Habrocoma are as complicated as in Capromys; those of the upper jaw, however, have the same simple form as in other *Octodontina*; moreover, the cranium of Habrocoma, in the extreme narrowness of the sphenoids, the large openings for the nerves, the large occipital opening, and, indeed, in its general structure, is more removed from Capromys than are the true Octodons.

root with rust-coloured hairs, sparingly clothed with brown hairs beyond.

The *Capromys pilorides* inhabits the forests of Cuba, where, according to M. Ramon de la Sagra, it is seen to climb the trees with great activity, both for safety when danger threatens, and to seek its food, which not only consists of fruits and the leaves and bark of trees, but likewise the flesh of animals, and especially of a species of Lizard, of the genus Anolis, which it hunts with great perseverance. It is readily tamed.

The specimens of Capromys in our English collections appear to me to be all referrible to the present species. In the museum of the Zoological Society are two adult specimens and a skeleton, which I will proceed to describe:—

One of these specimens, which lived in the Zoological Society's museum for some time, has the head almost entirely pure white, the crown and back part only being coloured like the back; a few dark hairs, however, are seen scattered with the others, but chiefly on the cheeks. The chin, throat, and chest, are pure white; the abdomen rusty yellow; on the sides and upper parts of the body, the hairs are black, excepting quite at the root, where they are greyish brown; and near the point, where they have a moderately broad ring of rich yellow: on the hinder parts of the body the yellow becomes deeper, and approaches to a rust colour, and at the root of the tail the hairs are entirely of a bright rust colour; about two inches of the tail is densely clothed with similar hairs; on the remaining portion, the hairs are of a deep brown colour; short, and being by no means abundant, they do not hide the scaly skin. The ears are tolerably well clothed with longish white hairs. The outer surface of the limbs is chiefly black, being but slightly pencilled with yellow; the fore legs are rusty-white internally, and the hind legs have the inner side clothed with bright rusty yellow hairs.

like those on the abdomen. The hind feet are almost entirely black, but from the end of the toes spring long white hairs: the fore feet are white. The dimensions of this specimen are given in the first column, which likewise includes the admeasurements of its skull.

The second specimen referred to, differs from the first in having only the fore part of the muzzle white; the fore legs slightly suffused with chestnut brown on the outer surface, and the hind legs and haunches almost entirely of a rich chestnut red, as well as the root of the tail; the throat and chest dirty white; the abdomen of a pale rust colour, but with many interspersed white hairs; the feet dusky brown; the toes for the most part clothed with dirty white hairs; the long hairs projecting over the nails of the hind feet are, however, most of them dusky; the hairs on the inner surface of the ears are some of them rufous, and others dirty white.

The skull figured in plate 12, was removed from a specimen in the British Museum, which I conceive is an immature individual of the present species: its fur is less harsh (though by no means soft) than that of the two adult animals already described; and on the upper parts and sides of the body the animal is pencilled with black and dirty yellow; all the hairs are, however, of an ashy grey tint at the root. On the head and cheeks the hairs are for the most part black at the extremity, and annulated with dirty yellowish white; the tip of the muzzle is grey white, as are also the chin and throat, whilst the abdomen is dirty yellow, and rather pale. The feet are brown, obscurely pencilled with a pale colour; the hairs springing from near the roots of the nails are white; the nails dark horn-coloured. The tail is clothed with hairs which average about half an inch in length, and which, though tolerably abundant, do not quite hide the scaly skin, excepting at the root of the organ; here they are of a rusty red hue, and beyond, the hairs are almost entirely of a pale

rusty yellow hue, obscurely tinted with brownish on the upper part of the apical portion of the tail. The ears are clothed with greyish white hairs internally, and the hairs of the moustaches are white at the root, and black beyond. The length of the animal, from the tip of the nose to the root of the tail, is 12″ 0‴; of its tail, 7″ 3‴; of the ear, 9‴; of the fore foot and nails, 1″ 5½‴; and of the hind foot and nails, 2″ 10½‴.

A specimen of *Capromys pilorides*[1], represented on Plate 3 of M. Ramon de la Sagra's work, agrees with the animal which furnishes the subject of my first description, with the exception that the fore part of the head is not white, as in the Zoological Society's specimen—a peculiarity which may probably be attributed partly to age, and partly to the circumstance of the animal having been long in confinement; and on Plate 4 of the same work is represented an almost uniformly sandy yellow variety of the animal.

	Zoological Society. Inches.	Lines.	Zoological Society. Inches.	Lines.
Length from tip of nose to root of tail	20	9	22	6
" of tail			11	6
" from nose to ear	3	3	3	5
" of ear	1	0	1	0
Width of ditto	1	3	1	4
Length of fore foot and nails ...	2	5	2	6
" *of ditto, not including the nail*	2	0½	2	3
" of hind foot and nails ...	4	0	4	0
" of ditto, without the nails ...	3	5	3	6
Height of animal, about	8	0	8	0
Length of skull	3	8	3	10
Width of ditto	1	11	1	10½
" of ditto between orbits ...	1	0¼	1	0¼
" of ditto at occiput	1	3¼	1	2¼

[1] Named *Capromys Furnieri* on the Plate. I may here mention that the earliest name given to this animal (*Isodon pilorides*) has not been adopted by mammalogists: the reason given for rejecting the generic term is, that it had been previously used for a different genus of Mammalia. I am aware, however, of no objection to Say's specific name, and therefore retain it.

	Zoological Society. Inches.	Zoological Society. Lines.	Zoological Society. Inches.	Zoological Society. Lines.
Length of nasal bones	1	2	1	2
Width of ditto behind		4¾		3¼
" " in front		7¾		6
Length of zygomatic arch	1	8¾	1	8½
Greatest depth of ditto		7¼		6½
Width of upper incisors		2⅝		3
From incisor to molar teeth	1	0	1	0
Length of four upper molars taken together		11		9½
Width of foremost molar		2½		2
Length of lower jaw	2	9	2	4½
Height of ditto behind	1	3¾	1	1¾
Length of angular portion	1	7½	1	3

The skeleton of the *C. pilorides* (Pl. 14), which is described by Prof. Owen[1], and well figured by M. Ramon de la Sagra, agrees in all essential points with the skeletons of the *Octodontina*, but has sixteen pairs of ribs, and consequently sixteen dorsal vertebræ (*d. v.* on the Plate). Of lumbar vertebræ (*l. v.*), there are seven; of sacral (*s. v.*), four; and of caudal vertebræ (*c d. v.*): I find twenty, in a skeleton in the Zoological Society's museum; one or two of the terminal vertebræ are, however, wanting in the skeleton. The last two or three of the cervical vertebræ (*c. v*) have slightly elevated spines; the foremost dorsal vertebra is furnished with a short spinous process, and the third, and several following dorsal vertebræ, differ from the corresponding bones in the Octodons, in having the spinous process as much produced (though not so stout) as that of the second dorsal. The femur (*f*) wants the prominent ridge on the outer surface, which is found in *Octodon*; in other parts I see no differences worthy of note. The admeasurements of the skull belonging to the skeleton referred to, are given in the second

[1] Proceedings of the Zoological Society, Part 2 (1832), p. 100 : other parts of the anatomy of the Capromys will be found described in detail by Prof. Owen in the same Part of the Proceedings—see pp. 68 to 76.

column of dimensions in the preceding page; the principal admeasurements of other parts of the skeleton are as follows:—

	Inches.	Lines.
Total length (measuring from the atlas vertebra)	22	6
Length of scapula (Pl. 14 *s.*)	2	1
Greatest width of ditto	1	9
Length of humerus (*h.*)	2	7
" of ulna (*u.*)	3	1
" of radius (*r.*)	2	6
" of fore foot	2	0
" of femur (*f.*)	3	3
" of tibia (*t.*)	3	3½
" of hind foot	3	7
" of tail, about	10	0

CAPROMYS PREHENSILIS.

Prehensile-tailed Capromys.

Capromys prehensilis. POEPPIG, Journ. of Acad. of Nat. Sci. of Philadelphia, iv. Part 1, p. 11. 1824.
" " GUERIN, Magaz. de Zool. 1834, cl. 1.
" " RAMON DE LA SAGRA, Hist. Phys. de l'Ile de Cuba, Mammifères, p. 12; Atl. Pl. 5 (and Pl. 8, figs. 2 and 3—skull). 1840.
" *Poeyi.* GUERIN, Mag. de Zool. 1834, cl. 1, Pl. 15.

Tail nearly equal to the head and body in length; fur moderate as to texture; on the upper parts, of a mixed grey and rufous tint; neck yellowish; forehead, cheeks, and throat yellow-white; chest and abdomen white; tail rufous at the base; toes clothed with whitish hairs.

Habitat, Cuba.

The *Capromys prehensilis* is known in Cuba by the name *Hutia Carabali*, and is said to confine itself to parts of the forests which are remote from the habitations of man, and to be more shy and less tameable than the *Hutia Congo*, or *C. pilorides*. Like the last mentioned species, it is an

expert climber, and, according to M. Ramon de la Sagra, it confines itself to the uppermost branches of the trees. Its tail is prehensile at the extremity; and the animal, assisted by this organ, is enabled to cling with security to the small twigs of the trees, or to the parasitic plants with which they are overgrown, and amongst which it usually conceals itself.

From *C. pilorides*, the present species is chiefly distinguished by the greater length of its tail, the less harsh nature of its fur, and its smaller size. The hairs of the fur are soft next the skin, but rigid at the point; on the upper parts of the body they are black at the root, grey in the middle, and rufous at the point. The tail is naked beneath at the extremity; the nails of the toes white.

	Inches.	Lines.
Total length, from tip of nose to end of tail	25	0
Length of tail	12	3
" of fore foot	1	7
" of hind foot and nails	3	8
" of ear		7

In the preceding description is incorporated the chief characteristics of the *C. prehensilis*, as pointed out by Dr. Poeppig. The skull of this animal, according to the well executed figures in M. De la Sagra's work, differs from that of *C. pilorides* in being considerably smaller, in having the cranial portion relatively narrower, and the zygomata more arched: the foremost molar of the lower jaw, it would appear, is more elongated, and wants the small third notch on the fore part of the inner side. Its principal admeasurements (taken from the figures alluded to) are as follows:

	Inches.	Lines.
Total length of cranium	3	0
Width from outer surface of zygomatic arches	1	6½
" of occipital portion		10½
Length from upper incisor to molar teeth ...		11
" of four upper molars, taken together		7

Capromys Poeyi. Guerin.

M. Guerin describes the *C. Poeyi* as follows :—

Fur soft and flexible ; of a chestnut colour, pencilled with rufous and yellow ; the hairs of a deep chestnut tint next the skin ; a great portion of them rufous at the point, whilst some are yellowish at that part : the head brown, with the exception of the forehead and cheeks, which are of a palish rufous yellow colour ; throat and abdomen white ; hairs of the moustaches white at the root, and of a chestnut brown hue beyond ; feet of a palish chestnut colour ; tail clothed *throughout* with long rufous hairs. Total length (including the tail) 26″ 4‴ ; of tail, 13″ 2‴.

MM Desmarest and Gervais, after having compared the *C. Poeyi* with two specimens of the *C. prehensilis*, arrived at the conclusion that the differences which were perceptible did not warrant the specific separation of these animals. The points of distinction observed were these—

C. prehensilis.	*C. Poeyi.*
Fur coarse, of a deep chestnut colour; dirty white on the abdomen, and slightly suffused with yellow : head of a pale golden brown, with some rust-coloured hairs.	Fur soft and flexible, of a chestnut colour, pencilled with rusty yellow ; abdomen whitish.
Hairs of the moustaches whitish at the root, and rusty at the point.	Hairs of the moustaches whitish at the root, and of a deep chestnut colour at the point.
Forehead yellowish white.	Forehead and cheeks rusty yellow.
Toes covered with whitish hairs; nails deep brown.	Toes covered with ferruginous hairs ; nails whitish.
Tail rather more than half the length of the body : thickly beset with hairs ; the extremity naked beneath.	Tail nearly as long as the body, entirely covered with long, brushy hairs.

Genus, *Plagiodontia*.

Plagiodontia. F. CUVIER, in Annales des Sciences Naturelles, vi. (Second Series), p. 347 (1836).

Echimyina with rootless molars, those of the upper jaw with a single deep fold of enamel on the inner side running obliquely forwards and inwards from near the posterior angle of the tooth, and a second deep fold entering from the outer side, near the anterior angle, and running in an opposite direction; molars of the lower jaw each with two deep folds on the inner side, and with one less deep fold on the outer side: toes 5—5: ears small: tail short, destitute of hair, and with a scaly skin.

But one species of this genus is known, an animal inhabiting the Island of St. Domingo, and which is evidently very nearly allied to the Capromys of the neighbouring island. Its short and naked tail, combined with certain differences observable in the structure of the molar teeth, furnish the chief distinguishing characters. Compared with the molars of the Capromys, those of the Plagiodontia are shorter in proportion to their width—in fact, the crowns of these teeth are very nearly equal in length and breadth, and approach to a rounded form: the foremost molar of the lower jaw, however, furnishes an exception, being decidedly longer than broad: and, with regard to the indenting folds of enamel, there is a well-marked difference in the upper molars of the Capromys and Plagiodontia; these teeth, in the latter animal, having but one external or internal fold, whilst in the former they have two folds on the outer side; and, moreover the indenting folds of the molars in Plagiodontia are remarkable for their oblique direction.

PLAGIODONTIA ÆDIUM.

(*Plate* 13, fig. 2).

Plagidontia ædium.	F. Cuvier, Ann. des Sci. Nat. vi. (New Series), p. 347, Pl. 17.
Capromys (*Plagiodontia*) *ædium.*	Wagner, Schreb. Säugth. Suppl. iii. p. 325.

The *Plagiodontia ædium* is described by M. F. Cuvier as a large Rat-like animal, somewhat less than the Common Rabbit, standing low on the legs, with small ears, and a short naked tail, having a scaly skin. Its fur is composed of two kinds of hair; the one fine and silky, which forms the chief clothing of the animal, and the other, longer and coarser: the finer hairs are grey at the root, and of a fawn colour externally, the latter colour occupying one-fourth of the entire length of each hair; the coarser hairs (which are tolerably abundant) are black, excepting on the under parts of the body, where they are whitish; here the softer hairs are of a pale yellowish brown hue.

	Inches.	Lines.
Length from tip of nose to root of tail ...	13	2
" of tail	5	5

This animal feeds upon roots and fruits; and being esteemed very good eating, it is so much sought after, that it has become very rare.

Genus, *Myopotamus*[1].

Myopotamus.	(Commerson) Geoffroy, Annales des Muséum, vi. p. 81, (1805).
Mastonotus.	Wesmael, Bullet. Roy. des Sci. de Bruxelles, Année 1841, 2me Partie, p. 61.

[1] From μῦς, a rat; and ποταμὸς, a river.

Echimyina with semi-rooted molar teeth, of which the hindermost in each jaw are the largest; each upper molar with two external, and two internal deep folds of enamel; the lower molars with three internal folds, and one indentation entering from the outer side: incisor teeth very large: palate much contracted between the front molar teeth: hind feet webbed: tail of moderate length, sparingly clothed with short hairs.

MYOPOTAMUS COYPUS.

The Coypu.

(*Plate* 15, fig. 1).

Mus Coypus.	MOLINA, Saggio sulla Storia Naturale de Chili, 8vo. ed. (1782), p. 287; 4to. ed. (1810), p. 239.
" *casteroides.*	BARROW, in Linnean Transact. xi. p. 168 (1812).
Myopotamus Coypus.	(COMMERSON) GEOFF., Ann. du Mus. vi. p. 81, (1805).
Hydromys "	GEOFF., l. c.
" "	DESM., Mamm. p. 296 (1822).
Potamys Coypou.	DESM., Dict. des Sci. Nat. xliv. p. 491.
Myopotamus Bonariensis.	RENGGER, Naturgesch. der Säugth. von Paraguay, p. 237 (1830).
Mastonotus Popelairi.	WESMAEL, Bullet. de l'Acad. Roy. des Sci. de Bruxelles, Année 1841, 2me Partie, p. 61.
Guillinomys Chilensis.	LESSON, Nouv. Tab. du Règne Anim. p. 126, (1842).
Quouiya.	AZARA, Essais sur les Quadr. de Paraguay, ii. p. 1.
Coypu Rat.	SHAW, Gen. Zool. ii. Pt. 1, p. 48.

Ears of moderate size; tail nearly equal to the body in length: fur long: the under fur very dense and soft; upper parts of the animal pencilled with dusky and brownish yellow, in about equal proportions; sides and under parts with the prevailing tint brown-yellow; tip of muzzle and chin white; a yellow patch immediately beneath the ear-opening: feet dusky brown.

Immature specimens—General hue rich brown; on the sides of the body, inclining to yellow.

The Coypu is very nearly equal in size to the Beaver, and bears a considerable superficial resemblance to that animal; its tail, however, is cylindrical, has a scaly skin, and is scantily clothed with short stiff hairs, like that of the Rat. It inhabits the rivers and streams of a great portion of South America, occurring on both sides of the Andes. On the eastern side it extends from Peru[1] southwards, to the Rio Chupat, in 43° 20′[2]. In the eastern portions of Brazil, the Coypu was not met with by the Prince of Nieuwied. On the west side of the Andes, this animal ranges, according to Mr. Darwin, from the valleys of Central Chile, (Lat. 33°) to 48° south, or perhaps even somewhat further, but does not extend to Tierra del Fuego. In the Chonos Archipelago, Mr. Darwin states, these animals, instead of inhabiting fresh water, live exclusively in the bays and channels which extend between the innumerable small islets of that group. They make their burrows within the forest, at a short distance from the rocky beaches. The inhabitants of Chiloe, who sometimes visit this Archipelago for the purpose of fishing, state that the Coypus here do not live solely on vegetable matter, as is the case with those inhabiting rivers, but that they sometimes eat shell-fish. The Coypu is said to be a bold animal, and to fight fiercely with the dogs employed in chasing it. Its flesh is white and well flavoured. At Buenos Ayres an extensive trade in the skins of the Coypus, there called Nutrias, or Otters[3], is carried on.

I learn from Mr. Bridges, that in the southern parts of Chile the Coypu abounds more in the lakes than in rivers, and more especially frequents those waters in which the *Typha latifolia* and *Scirpus* are plentiful, and serve to give them shelter. The Coypu is most abundant, according to Mr. Bridges' observations, on the borders of the River Maypo,

[1] Tschudi, Fauna Peruana. [2] Darwin, Voy. of the Beagle.
[3] Voy. of the Beagle, pp. 78-9.

near Santiago, and in the lakes of Aculeo and Quintero. In the breeding season, which is in the months of September and October, the Coypus emit a mournful cry, which much resembles that of a child when in distress. The female Coypu evinces much attachment for her young, and swims with them on her back, until they are sufficiently large to follow the parent. This habit helps to explain the singular position of the nipples noticed in the female Coypu. Of these, four were found, by M. Lereboullet, on each side of the body, and situated rather above the mesial line of the flanks, the foremost being placed behind the shoulder, and the hindermost in front of the thigh[1].

A series of specimens of the Coypu in the British Museum collection exhibits the differences of age in this animal from an early period upwards. A fine large specimen of two feet in length, without including the tail, has the upper parts of the body pencilled with black and brown-yellow, in about equal proportions; on the sides of the body the yellow hue slightly prevails; and the under parts can scarcely be said to differ from the flanks in the colouring. The long, dense, and soft under fur is of a brown-black hue on the upper parts of the animal, dusky brown on the sides of the body, and of a less deep brown on the under parts. Of the long hairs, which are tolerably abundant, and by no means harsh, the longest are entirely black on the upper parts of the body; and others, which are more numerous,

[1] See M. Lereboullet's Paper on the Anatomy of the Coypu, in the Mémoires de la Société du Muséum d'Histoire Naturelle de Strasbourg, iii. Pt. 3 (1843). Mr. Christie had previously called the attention of naturalists to the position of the mammæ in the Coypu, which he describes as being "situated extremely high up on the sides"—see Proc. of the Zool. Soc. for 1835, p. 182. This position of the nipples, rather on the sides than the under part of the body, perhaps will be found a common circumstance in the Hystricine division of Rodents, since I have found them so situated in the genera *Lagostomus*, *Octodon*, *Habrocoma*, and *Nelomys*: here, however, they are perhaps placed somewhat less high on the flanks than in the Coypu.

are black at the point, and annulated with brownish yellow towards the point. The feet are dark brown: the naked soles are black. The fore feet present no points of structure to arrest our attention, there being the usual number of toes, and a short thumb, with a curved and truncated nail of moderate size. The hind feet are remarkably large, and four of the long toes are united by an ample web: the outer toe is free, but has a narrow band of loose skin along its inner surface. The nails of the toes are long, hollow beneath, and by no means deep, nor strongly compressed: those of the hind feet, which are the longest, are but little arched. The tip of the muzzle is clothed with small white hairs throughout (very distinctly so in the young animal), with the exception of a narrow space adjoining the nostrils. The chin is white, and so are the portions of the lip which overlap the palate anterior to the molar teeth. The upper lip is not cleft, being merely notched immediately above the large incisor teeth, which latter are of a deep orange colour in front. The tail is nearly as long as the body—not including the head—and sparingly clothed with short stiff hairs, which spring from between the scales with which the skin is covered, as in the Common Rat. The admeasurements of this specimen are given in column No. 1.

A second specimen of rather smaller size differs only in having the flanks considerably suffused with yellow[1]. Other specimens, still smaller, are almost entirely of a rich brown colour, somewhat inclining to yellow on the sides and under parts of the body: and a very young specimen, of about eight inches in length, differs from these last, in having the tail well covered with bright reddish brown hairs. All the specimens have dark brown feet, the tip of the muzzle and chin white, and a large yellow patch immediately beneath the ear opening.

[1] Its dimensions are in column No. 2.

	No. 1.		No. 2.		No. 3.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length from tip of nose to root of tail ...	24	6	18	6	17	0
" of tail	17	6	12	9	10	0
" from tip of nose to ear	4	8	3	4	3	3
" of ear		8½		7½		7½
Width of ditto	1	4	1	1½	1	1½
Length of fore foot and nails	2	9	2	3	2	2
" of the nail of the middle toe of ditto		6		5		5
" of hind foot and nails	5	6	4	7	4	5
" of the nail of the middle toe ...		6		5		5½

In the structure of its teeth the Coypu will bear a tolerably close comparison with the Beaver; the molars of the Coypu, however, are rooted, the foremost in either jaw distinctly so; the hindermost are more deeply implanted in their sockets, and have short roots[1]. With regard to the folds of enamel, they are disposed as follows in the teeth of the adult animal: each upper molar has a loop or fold entering the crown in the middle, and on the inner side, and extending half way across the tooth, and on the outer half of the crown, are seen three transverse areas enclosed by enamel, each extending from the outer side of the tooth to the middle, or very nearly so; the hindermost molar, however, differs from the rest in having but one of these isolated areas; that corresponding to the second area in the other teeth here assumes the form of a loop, entering from the outer side of the tooth, and the third area in like manner is replaced by a fold of

[1] The molars of the Coypu do not become rooted at so early a period as in the Rats and Echimys group, nor does the body of one of these teeth begin to divide into roots so near the crown as in those animals: hence (with the exception of the foremost molar of each series) we cannot perceive that they possess roots until they are removed from the jaw: in the Rats the roots are visible when the tooth is in the socket. Molars presenting the conditions of those of the Coypu I distinguish by the term semi-rooted.

enamel, but this enters from the inner side of the tooth. The molars of the lower jaw have one moderately deep fold entering from the middle of the outer side, and three deeper folds on the inner side, except it be in the two foremost molars, where the inner folds have assumed the form of isolated areas, corresponding to those on the outer half of the upper molars. In the half-grown animal, where but three molars of each series are developed, the foremost molar has one internal and three external folds of enamel; the second has two internal and two external folds, and the third molar has three loops of enamel, two external and one internal, and a transverse lobe behind, which is entirely surrounded by enamel.

The skeleton of the Coypu is essentially the same as in the genera *Echimys*, *Capromys*, and *Octodon*, and therefore differs considerably from that of the Beaver, with which animal the Coypu has been associated. The incisor teeth of the animal before us being very large, the zygomatic arch is deep and strong, and the temporal ridges meet to form a slight crest: the palate is moderately broad behind, but is exceedingly contracted between the foremost molar teeth—these teeth, indeed, almost meet. The form of the occiput is worthy of notice, since, besides the ordinary processes which correspond to the mastoid, and which are very large, there are two other processes; they are smaller than the first, above which they are placed, but are still very prominent: a small portion of the petro-tympanic bone separates the two processes on either side of the occiput. The lower jaw is chiefly remarkable for the small size of the coronoid process (a mere tubercle, which projects but little above the crowns of the molar teeth), and for the angular portion being thrown boldly outwards, and thus giving a great width to the space between the rami behind. The lower edge of the angular portion is much expanded, and produced into an angle on the inner side. The

vertebræ are—dorsal, 13; lumbar, 6; sacral, 4 (anchylosed); caudal, 26[1].

	Inches.	Lines.
Total length of skeleton	32	8
of which the skull is	4	8
Width of skull	2	9
Length of nasal bones	1	9
Width of ditto in front		9½
" " behind		6
" between orbits		11
From incisor to molar teeth	1	4
Width of incisors		6
Length of four upper molars, taken together	1	2
" of lower jaw	4	0
Width behind	3	2
Length of scapula	2	6
" of humerus	2	8
" of ulna	3	9
" of radius	3	0
" of fore foot	2	4½
" of femur	3	5
" of tibia	4	1
" *of hind foot*	5	0
" of caudal vertebræ, taken together ..	16	7

[1] Mr. Martin, who gives a detailed account of the anatomy of the Coypu in the Proceedings of the Zoological Society for November, 1835, expresses his regret that he was unable to examine the bones of the extremities, since Cuvier notices a peculiarity in those of the *carpus*. I may mention that in two carefully prepared fore feet of the Coypu now before me, I can perceive nothing abnormal—they present the ordinary Rodent structure in this part; the true carpal bones are eight in number; three in the upper range, viz. the pisiform (Pl. 14, fig. 2 *ps*) and cuneiform (*c*), and a large transverse bone formed by the junction of the scaphoid and lunare (*sc. l*); and, besides the ordinary four bones in the lower range, there is a small triagular bone (*) wedged in between the os magnum (*m*), trapezoides (*ts*), and lunare. Beyond these are two other bones, which are less constant, a large flat bone (†) on the inner side of the wrist attached partly to the scaphoid and partly to the trapezium (*tm*); and a somewhat smaller flat bone on the outer side of the wrist, which joins the pisiform.—The bone *un*, in the figure referred to, is the unciform; and the bones *mc* 1 to *mc* 5, are the five metacarpals; *mc* 1 being the metacarpal bone of the thumb, or inner toe. The tarsus of the Coypu is represented on the same Plate, fig. 3: *cm*, is the calcaneum; *a*, the astragalus; *n*, the naviculare; *cb*, the cuboid; *c* 1, the internal cuneiform; *c* 2, the middle cuneiform; and *c* 3,

Genus, *Petromys*.

Petromys. Smith, South African Quarterly Journal, No. 5, p. 2 (1831); and id. Second Series, vol. i. p. 146.

Echimyina with the molar teeth very nearly equal in size, and rooted; their crowns of a quadrate form, placed obliquely in the jaw, so that the inner front angle is the most forward; each tooth with a single indenting fold of enamel on either side, the folds of opposite sides meeting in the mesial line of the tooth: incisor teeth small and compressed, rather deeper than wide, and flat in front: body clothed with fur of the ordinary kind; ears rather small—hairy: feet small; toes 5—5, the thumb exceedingly small, but provided with a small nail: tail about equal to the body in length, well covered with moderately long hairs, which gradually increase in length towards the apex of the organ, where they are longest.

Habitat, South Africa.

The little animal on which the genus *Petromys* is founded is remarkable amongst the Old World Rodents for presenting characters which are almost peculiar to the species of South America. In having a brushy tail, and a separate small groove within the ant-orbital opening for the infra-orbital nerve, as well as in having but one indenting fold of enamel on either side of each molar tooth, it agrees with the Octodons, but it differs from those animals, and resembles the *Echimyina*, in having the molar teeth rooted. The extremity of the muzzle is clothed with small hairs, with the exception of a very narrow space around the nostrils, which is naked: the upper lip is merely notched immediately above the incisor teeth. The feet are rather small, and naked (and apparently smooth) beneath; the toes are provided with small, curved, and com-

pressed claws. The stomach is oblong, curved, and of nearly equal diameter at each extremity; the cœcum is voluminous[1].

The skull of the Petromys is remarkably depressed; the cerebral portion short and broad; the facial portion narrow, and slightly elongated; the upper surface almost flat; the ant-orbital opening large; the zygomatic arch short and deep, the malar bone produced, above, into an obtuse post-orbital process; and, below a distinct ridge which crosses its outer surface almost horizontally—descending slightly, however, towards the fore part of the zygoma—is a narrow plate of bone, which, commencing near the anterior root of the zygoma, runs back, and terminates abruptly near the middle of the malar bone. The incisive foramen is large, extending from a point opposite the front edge of the foremost molar, to within about $\frac{1}{12}$th of an inch from the incisors, and with a width of $1\frac{1}{3}$ lines. The palate between the molar teeth is narrow, being about $1\frac{1}{4}$ lines in width at the widest part, which is behind, and scarcely one line in width between the front molars. The post-palatal emargination is V-shaped, the apex of the angle being rather behind the last molar teeth. The auditory bullæ are tolerably large, and very convex. The occipital bone sends out two branches on either side, as in Echimys: the one, directed outwards and downwards, terminates a little behind the ear-opening; the second is widely separated from the first by a portion of the petro-tympanic bone, and descends vertically, forming the ordinary mastoid process of the ex-occipital bone. The coronoid process of the lower jaw is small, and the condyloid process is but little elevated. The angular projection on the inner side of the lower edge of the angular portion is but little marked.

[1] These parts are beautifully figured, together with other details, in Dr. Smith's "Illustrations," &c. No. ix. Pl. 21.

Genus, *Dactylomys*.

Dactylomys. Is. Geoffr., Magasin de Zoologie, par M. Guérin-Méneville, Année 1840, Mammifères, p. 27.
" Wagner, Schreb. Säugth. Suppl. iii. p. 347 (1843).

Echimyina with but four toes to the fore feet, and these armed with short, convex nails; the intermediate pair of toes long: the series of molar teeth of opposite sides of the upper jaw converging and nearly meeting in front; all the molars relatively large; those of the upper jaw each composed of two separate lobes, which are contracted and pointed on the inner side of the tooth; and broad, and with a deep fold of enamel, on the outer side: the foremost molar of the lower jaw with one external and two internal folds of enamel, and the remaining molars each with two lobes, of which, one—forming the hinder part of the tooth—is narrow and transverse; the other is broad on the inner side of the tooth, where it has a deeply indenting enamel fold.

The genus *Dactylomys* is founded by M. Isidore Geoffroy St.-Hilaire upon an animal which had long previously been known, having been described by Desmarest and others, under the name *Echimys dactylinus*. From Echimys it is readily distinguished by the total absence of a thumb to the fore foot, the inequality of the toes of the same foot, the middle pair being considerably longer than the outer toes, and by these toes being provided with short, convex, and but little pointed nails. Beyond these points, it may be observed that the fur of the animal is destitute of the spines which are generally characteristic of the Echimys group. The ears are small; the hind feet short and broad; the tail long, exhibiting rings of scales like the Rat's tail, and (excepting at the base) having only short and stiff hairs springing from between them. Recently a second species has been added to this genus by Dr. Wagner.

DACTYLOMYS TYPUS.

The Typical Dactylomys.

Echimys dactylinus.	(Geoff.) Desmarest, in Nouv. Dict. d'Hist. Nat. tom. x. p. 57 (1817); Mammalogie, p. 291 (1822).
" "	F. Cuvier, in Nouv. Annales du Muséum, i. p. 450, Pl. 18, fig. 3 (teeth); and Pl. 19, figs. 5 and 6 (skull).
Loncheres dactylina.	Fischer, Synopsis Mammalium, p. 306.
Dactylomys typus.	Is. Geoff. in Magas. de Zool. Année 1840, Mammif. pp. 29 and 47, Pl. 20 (animal), and Pl. 28, figs. 1—3, molar teeth.
" "	Wagner, Schreb. Säugth. Suppl. iii. p. 348.

Hairs of the fur long, and somewhat harsh; upper parts of the body freckled with black and yellow; under parts, as well as the head and feet, dirty yellow-white; the hairs on the upper surface of the head very long, especially towards the hinder part: tail longer than the head and body taken together.

The only specimen of this species which is known to us exists in the Paris collection, and was originally brought from the Museum at Lisbon. No doubt it is a native of South America, and is most probably from Brazil. The specimen in question I examined a few years since, and the following notes of its chief characters were then inserted in my memorandum-book. Ears small; tail longer than the head and body taken together; about two inches of its length—being the basal portion—clothed with fur like that on the body, the remaining portion with rings of small scales, as in the Rat's tail, and with small, but stiff hairs, springing from the interstices: fore feet with the middle toes long, far exceeding the outer toes in length; the thumb wanting; hind feet broad. Fur long and somewhat harsh; on the upper parts of the animal the hairs are black towards the point,

yellowish white at the point, and with the hidden parts of a deep rust colour: the feet and under parts of the animal are of a dirty yellow-white hue. The head is clothed for the most part with long dirty yellow-white hairs; those on the hinder part of the head, which are the longest, are about an inch in length. The occiput is tinted with rust colour. The hairs of the moustaches are dirty white at the root, and brown at the opposite extremity. The tail is brown, but becomes whitish at the apex. The hairs on the middle line of the back are about an inch and a quarter in length.

	Inches.	Lines.
Length from tip of nose to root of tail ...	14	0
" of tail	16	6
" of hind foot	2	3

DACTYLOMYS AMBLYONYX.

Hairy-tailed Dactylomys.

Dactylomys amblyonyx. (Natterer) Wagner, in Wiegm. Archiv für Naturgesch. 1845, Pt. 2, p. 146.

This species is briefly described by Dr Wagner as being of a yellow hue sprinkled with black, with the under parts of a beautiful ochre colour; the nails of the toes dilated, and the tail clothed with hairs throughout.

	Inches.	Lines.
Length of the head and body	9	6
" of tail	12	0

Inhabits Ypanema, in Brazil.

Genus, *Loncheres*.

Loncheres. Illiger, Prodromus Systematis, Mamm. &c. p. 90 (1811).
" Fischer, Synopsis Mammalium, p. 306 (1829).
" Wagner, Schreb. Säugth. Suppl. iii. p. 329 (1843).

Nelomys. JOURDAN[1], Annales des Sci. Nat. Dec. 1837, viii. p. 370.
" IS. GEOFF., Magas. de Zool. Année 1840, p. 36.
" PICTET, Mém. de la Soc. de Phys. et d'Hist. Nat. de Genève, viii. p. 201 (1842).
Phyllomys. LUND, in K. Danske Vidensk. Selsk. Naturv. Afhandl. 1841, viii. p. 243.
Isothrix. WAGNER, in Wiegm. Archiv für Naturgesch. 1845, Part 2, p. 145.
Echimys (part). GEOFFROY ST. HILAIRE.

Echimyina with short and broad feet; ears somewhat small; molar teeth rather large, and longer than broad; those of the upper jaw each with two principal transverse folds of enamel, often completely dividing the tooth; and those of the lower jaw with one external, and two internal folds of enamel. Palate narrow — most so between the foremost molars.

Habitat, Brazil and Guayana.

Like the species of *Echimys* (the genus next to be defined), the members of the present section usually have numerous elongated lance-shaped spines mixed with the hairs of the ordinary fur—often, however, chiefly confined to the upper parts of the body; but they may be distinguished by their shorter and broader feet, and by the toes being much less unequal in length. Thus, in *Loncheres Blainvillii*, the nail of the inner toe terminates in a line with the middle portion of the adjoining toe, whilst in *Echimys Cayennensis*, the

[1] To M. Jourdan is due the credit of having clearly pointed out the principal characters of the present genus; and to M. Is. Geoffroy we are indebted for a more detailed enumeration of the points of distinction between this and other genera, as well as for an excellent Monograph of the genus *Echimys*, as originally instituted by his father, and which included several species of the present section. As, however, Illiger had, as early as the year 1811, founded a genus (*Loncheres*) upon an animal named by him *Loncheres paleacea*, and which is in every particular a true member of M. Jourdan's genus (instituted in 1837), the law of priority obliges me to use the older name. It is true that Illiger's definition is imperfect, but if such are considered sufficient grounds for discarding his generic term, very many of the genera of Mammalia may have their names changed upon a similar plea.

smaller inner toe terminates opposite the base of the toe next to it; this latter (the second toe) has a very broad, hollow, and obliquely truncated nail, whilst in the *Echimys* the corresponding nail can scarcely be said to differ from the nails of the other toes, which are compressed, curved, and pointed. The muzzle is more blunt in the species of *Loncheres* than in those of Echimys, the ears are smaller, and the tail is usually thicker. The molar teeth are relatively larger, and of a more complicated structure. The upper molars in Loncheres have one internal, and three external folds. The inner fold enters the tooth about midway between the extremities; and of the three external folds, the central one enters the tooth opposite the inner fold, and, in traversing the crown of the molar, is indistinctly curved, so as to pass slightly beyond, and behind the inner fold, which it touches. Whilst these central folds or loops of enamel by their meeting divide the crown into two very nearly equal parts, the remaining two external folds traverse the tooth so as again to divide each half. Such is the structure of the first and second upper molars in a specimen of *Loncheres cristata* now before me. In the third molar, which is rather less worn, this difference is observable,—that the mesial folds do not yet show the looped ends, and the body of the tooth is completely divided by a transverse groove. The fourth molar, which presents a still earlier condition, is divided in the middle like the third, but the hinder half of the tooth is perfectly divided by a transverse groove. In *Loncheres Blainvillii*, I find that the hindermost of the external folds, owing to the molars being much worn, assumes the form of a small isolated transverse area, or (in the second and third molars) of two such areas. The molar teeth of the lower jaw, both in *Loncheres cristata* and *L. Blainvillii*, have each one external and two internal loops of enamel; they enter deeply into the body of the tooth, especially the internal loops, and,

in passing inwards, incline obliquely forwards. The foremost molar differs from the others in having an extra triangular lobe in front, in the middle of which is a small circular or oval area enclosed by enamel.

The first and second upper molars of *Loncheres semivillosa* are represented by M. Isidore Geoffroy as having each two external and two internal loops of enamel[1].

Dr. Wagner separates from the genus *Loncheres* certain species in which the fur is of the ordinary kind—having no admixture of spines; these are associated under the sectional name *Isothrix*: we shall first describe those species which may be called

Loncheres proper.

Upper parts of the body with numerous, bristly, flattened spines[2], mixed with the hairs of the ordinary fur.

LONCHERES CRISTATA.

White-crested Loncheres.

Echimys cristatus. (Geoff.) Desm., Nouv. Dict. d'Hist. Nat. tom. x. p. 55 (1817); Mammif. Pt. 2, p. 291.

Loncheres paleacea. (Illiger) Licht., Abh. der K. Akad. der Wissensch. in Berlin, 1818-19, p. 191.

" " Kuhl, Beitr. zur Zool. p. 72 (1820).

Nelomys cristatus et *paleaceus.* Is. Geoff., Magas. de Zool. 1840, p. 49, Pl. 21.

[1] See Guérin's Magasin de Zoologie, année 1840—Mammifères, Pl. 28, fig. 7.

[2] These, which I have termed spines, are of course merely modified hairs: they are formed nearly like a lance-head, but are much elongated. The broadest part of these spinous hairs is near the root, and below this part they become suddenly contracted into a very slender stalk which is inserted in the skin: from a short distance above the root they gradually taper to terminate in a sharp point; they are nearly flat, but have the under surface slightly convex, and the upper surface concave, in a corresponding degree; on this surface, moreover, the margins are thickened so as to form a narrow, elevated ridge on either side of the hair.

Loncheres paleacea et cristata.	WAGNER, Schreb. Säugth. Suppl. iii. p. 332. (1843).
Myoxus chrysurus (Gilt-tailed Dormouse).	SHAW, Gen. Zool. ii. Pt. 1, p. 169 (1801).
Hystrix chrysuros.	SCHREB. Säugth. Supp. Pl. 170 B.
Lérot à queue dorée.	(ALLAMAND) BUFFON, Hist. Nat. vii. Suppl. p. 283, Pl. 72 (1789).
Echimys à queue dorée.	CUV. Règne Animal, ed. 1829, i. p. 199.

Upper parts and sides of the body covered with broad spines; general colour brown; dark on the back, reddish on the sides of the body, and pale on the abdomen; upper surface of the head white; the hairs on this part stiff, and very long, especially towards the occiput; region of eye and occiput black; tail black, with the apical half (or more, or less) white.

Inhabits Guayana and Para.

In giving Para as a habitat for this species as well as Guayana, I must observe, that some authors regard a certain specimen of *Loncheres*, named by Illiger *paleacea*, as distinct from the *L. cristata*, and if this view be correct, Guayana only must be given as the habitat of the latter animal. That there are no good grounds, however, for regarding the *L. paleacea* and *L. cristata* as distinct species, I shall hereafter show.

In my note-books I have descriptions of three specimens of the *L. cristata*; one from a specimen in the Paris Museum, which I have good reason to believe is the individual named by M. Geoffroy; it is from Cayenne. The second description is from a specimen in the Leyden Museum, received from Surinam; and the third is from a specimen in the British Museum, captured in British Guayana. Upon comparing these descriptions, I find the three animals agree very closely, excepting that the white is more or less extended on the tail. Their general hue is rufous-brown; dark on the back, brighter on the sides of the body, and palish on the abdomen: the upper surface of the head and muzzle, as well

as the sides of the latter at the tip, and the chin, are white; the white hairs on the head are for the most part flattened and bristly, and towards the occiput they are very long, and form a conspicuous, depressed tuft, projecting over the occiput, which is black, as is also a considerable space around each eye. The cheeks are dusky; some of the stiff hairs on these parts being dusky, whilst others are brown. The tail is clothed with coarse hairs, for the most part averaging rather more than a quarter of an inch in length, but which become longer at the apex of the organ, where they are full an inch in length; they are not sufficiently numerous entirely to hide the scaly skin. The root of the tail is of the same colour as the body; the terminal portion white, and the intermediate part black. In the Paris specimen about one-half of the tail is white; in the Leyden individual, about two-thirds of the organ is covered with white hairs; whilst in that in the British Museum, one-third of the tail is white. The back and flanks are almost entirely covered with flattened spiny hairs, averaging an inch or more in length, and about one line in width at the broadest part; they are brown-white at the root, dusky brown towards the point, and many of them rufous at the point. Mixed with these spines are dirty rust-coloured hairs, which are very scanty on the back of the animal, but become more numerous on the flanks.

	Paris Mus.		Leyd. Mus.		Brit. Mus.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length from tip of nose to root of tail ...	13	0	11	9	12	0
" of tail, about	13	4	13	0	8	8
" of ear, about				4		4½
" of tarsus and nails	2	1	2	0?	1	11½
" fore foot and nails					0	11
" of the four upper molar teeth, taken together						6¾
" of the lower jaw, measuring from the back of the condyle ...					1	5¼

Hystrix chrysurus. SCHREB.

The *Hystrix chrysurus* of Schreber, or *Myoxus chrysurus* of Shaw, are founded upon the animal described by Allamand in Buffon's great work, under the name "*Lérot à queue dorée.*" With regard to this animal, it is only necessary to state that the original description was drawn up from a very young animal preserved in spirit, and that the yellow colour of the mark on the upper part of the head, as well as the yellow end to the tail, are almost without doubt due (as M. Is. Geoffroy suggests) to the hairs on these parts being stained by the spirit; they having originally been white. Beyond the yellow colouring of the parts in question, and the small size, the animal does not appear to differ from the *E. cristata.*

Loncheres paleacea. (ILLIGER) LICHTENSTEIN.

The animal thus named is only known to us by Lichtenstein's description and figure; from an examination of which, M. Is. Geoffroy concludes that it forms a species distinct from the *L. cristata,*—an opinion in which Dr. Wagner coincides. The points of distinction, according to M. I. Geoffroy, are, that in the *L. paleacea* the back of the head and cheeks are of the same general hue as the other parts of the body, and not black, as in *L. cristata*; that the hairs of the moustaches are whitish, whilst in *L. cristata* they are black; and, lastly, that the tail is of the same colour at the base as the body, and that the remaining portion, being three-fifths of the entire length, is white; whilst in *L. cristata* two-fifths of the tail only are white![1]

[1] With regard to the colour of the hairs of the moustaches, I have to remark, that in the British Museum animal already referred to, some of the hairs of the moustaches only are black, those nearest the tip of the muzzle being dirty white. This same specimen has but one-third of the tail white, whilst in the Leyden specimen two-thirds of the tail are white, and in the Paris individual one-half of the tail is clothed with white hairs; thus showing that the white is more or less extended on this organ. Lastly, as Lichtenstein, in his very short description, does not absolutely state that the sides of the head and the occiput are of the same colour as the body of the animal, it is scarcely safe to conclude that such

LONCHERES BLAINVILLII.

The Black-tailed Loncheres.

Nelomys Blainvillii. JOURDAN, Annales des Sciences Naturelles, (Second Series) viii. p. 371 (1837).

" " IS. GEOFFROY, Magas. de Zool. Année 1840—Mammifères, pp. 19, 41, and 49, Pl. 22; and for the dentition. Pl. 28, figs. 10—12.

Loncheres Blainvillei. WAGNER, Schreb. Säugth. Suppl. iii. p. 334.

General hue of the animal bright sienna-yellow; chin, throat, and, in fact, the whole of the under parts, pure white; fore feet also white; hind feet yellow: tail nearly as long as the head and body together, and with black hairs, excepting at the root, where the hairs are of the same yellow hue as those of the body.

Inhabits Brazil, in the vicinity of Bahia, and is likewise found in a small island (I. of Deos) off the coast of Bahia.

A well-preserved specimen in the museum of the Zoological Society, and which is from Bahia, presents the following characters. Limbs rather short and stout; feet short; tail nearly as long as the head and body taken together; ears small, slightly emarginated posteriorly. On the upper parts of the body, flattened spinous hairs predominate; they average about an inch in length, and $\frac{1}{24}$th of an inch in width at the widest part: the sides of the body are clothed with spines and hairs in about equal proportions, and the under parts are covered with stiff hairs; these latter are pure white to the root. The spines on the sides of the body are grey-white at the root, dusky in the middle, and of a rich yellow colour

is the case from the inspection of the somewhat indifferent figure which accompanies his account; and even if these parts are brown in Lichtenstein's animal, the difference between it and the *L. cristata* is but slight, since in the latter animal they vary from black to brown-black.

(inclining to rufous) at the point; many of the spines on the back are similarly coloured, but some are dusky at the point, and hence a slight pencilling of this dark hue is seen mixed with the rich sienna-yellow, which is the prevailing colour. The ears are provided with a tuft of extremely fine hairs immediately behind the opening, some of which hairs are nearly an inch in length The fore feet are white, but tinted with yellow on the wrist; the hind feet are yellow, and the toes are white at the sides; the nails of the toes are white. About one inch of the tail, being the basal portion, is clothed with spiny hairs, coloured like those of the adjoining part of the body; the remaining portion is well covered with hairs, averaging about half an inch in length, and which are almost entirely black; the exceptions being, that towards the base they gradually assume a brownish tint, and on a considerable portion of the under surface they are dusky brown. The hairs of the moustaches are black: a white spot is observable in front of the ear.

	Zoological Society.		From Wagner.	
	Inches.	Lines.	Inches.	Lines.
Length from tip of nose to root of tail	11	6	8	0
" of tail, about...	8	6	7	9
" *from nose to ear*	1	11		
" of ear, about		4½		
Width of ditto		8½		
Length of fore foot and nails ...		10		
" of hind foot and nails	1	6	1	
" of skull	2	1½		
Width of ditto	1	0¼		
" between orbits		6¼		
Length of nasal bones		7¾		
Width of ditto behind		1¼		
" " in front		2⅝		
From incisor to molar teeth ...		5½		
Length of four upper molars, taken together		5⅝		
Space between foremost molars ...		0¾		
" between hindermost ditto ...		2		
Width of incisors		1⅜		

LONCHERES ARMATA.

Strong-spined Loncheres.

Mus hispidus.	LICHT., Darstellung der Säugth. &c. Tab. 35, fig. 2.
Nelomys armatus.	IS. GEOFF., Annales des Sciences Naturelles, 1838, tom. x. p. 125; Magas. de Zool. 1840, Mammif. pp. 12, 42, and 51.
Loncheres armata.	WAGNER, Schreb. Säugth. Suppl. iii. p. 335.

Upper parts of the body armed with broad and strong spines; tail about equal to the body, only, in length, with spines on the upper surface at the root, and scattered, small, whitish hairs beyond: general hue brown, but pencilled with yellow; under parts dirty pale yellow; muzzle rufous.

Inhabits Cayenne.

This species was first described by Dr. Lichtenstein, who, having the impression that it was identical with Geoffroy's *Echimys setosus*, gave to it the same specific name. That it is a perfectly distinct species has been proved by M. Isidore Geoffroy. It is said to be armed on the upper parts of the body with spines of about three-quarters of an inch in length, and three-quarters of a line in width, and mixed with these are ordinary hairs, which, however, are not sufficiently numerous to hide the spines; these latter are not confined to the back, for they extend on to the hinder portion of the head, as well as on the upper surface of the tail at the root; about one inch of the tail is thus armed; the remaining portion has small scattered white hairs. The moustaches are black; the nails of the toes white; the feet whitish.

	Inches.	Lines.
Length from tip of nose to root of tail ...	8	0
" of tail	6	0
" of ear		4
Width of ditto		4
" of hind foot and nails	1	5

Loncheres didelphoides.

Echimys didelphoides.		(Geoff.) Desmarest, Nouv. Dict. d'Hist. Nat. x. p. 58; Mammalogie, p. 292.
Loncheres	"	Fischer, Synopsis Mammalium, p. 307.
Nelomys	"	Is. Geoff., Magas. de Zool. année 1840, pp. 41 and 50, Pl. 24.

Ear small; tail rather shorter than the head and body taken together; scaly, and with very short, scattered, brown hairs, excepting at the root, where it is well clothed: long, narrow spines cover the upper parts, and sides of the body, and mixed with these are dirty yellow hairs, which are, however, by no means abundant: upper parts of the body brown, pencilled with yellow; sides of the body, as well as the feet, yellow-brown; lips, throat, and abdomen, dirty yellow-white; moustaches brown.

The above short description is taken by myself from the specimen in the Paris collection; the original of all the descriptions under the names above quoted. It is evidently a young animal, and, M. Is. Geoffroy informs us, was withdrawn from spirit, and hence its colouring has, no doubt, been somewhat changed by this mode of preservation.

In having the root of the tail well clothed with hairs, the *L. didelphoides* approaches the *L. armata*, but M. Isidore Geoffroy, judging from Lichtenstein's description of the latter animal, concludes that *L. didelphoides* differs in having the hairs continued for a greater extent on the basal portion of the organ; in having the small scattered hairs which are observable in the remaining portion of the tail dark, instead of white; in the slenderness of the spines[1], and, lastly, in

[1] The spines of *L. armata* are said to be $\frac{3}{4}$ of a line wide, and 9 lines in length (Prussian measure)—having the length only twelve times greater than the width; whilst in *L. didelphoides* the spines on the middle of the back are, according to M. Geoffroy, $9\frac{1}{2}$ lines in length, and only $\frac{1}{3}$d of a line in width (French measure), the width being $\frac{1}{28}$th part of the length.

some peculiarities in the general colouring. I must confess these differences do not appear to me to furnish sufficient grounds for our regarding the two animals as distinct, since the colouring of the only known specimen of *L. didelphoides*, for reasons before stated, cannot be depended upon, and since the animal is admitted to be young, a state in which the spines differ from those of the adult animal. The admeasurements of the *L. didelphoides* are—

	Inches.	Lines.
From the nose to the root of the tail ...	7	4
Length of the tail	6	10
" of the hind foot and nails	1	3
" of ear, about		3½
From nose to ear	1	3

The animal is probably from Brazil; it was removed from the Museum at Lisbon to Paris, during the occupation of Portugal by the French.

LONCHERES OBSCURA.

Dusky Loncheres.

Loncheres obscura. WAGNER, Abh. der Bayr. Akad. der Wissensch. iii. p. 196, Tab. 2, fig. 5—12; Schreb. Säugth. Suppl. iii. p. 336.

Brown, freckled with yellow; belly yellowish; tail equal to the head and body in length, and provided with very short, scattered hairs.

Inhabits Brazil.

Two specimens of this species were brought by Spix from Brazil. According to Dr. Wagner, the animal is of a robust form, and has the short feet and thick tail which characterize most of the species of *Loncheres*. The upper parts of the body, and the shoulders and thighs, are clothed for the most part with spines, mixed with which are some scattered coarse hairs;

on the other parts, coarse hairs only are found. The incisor teeth are white, and the claws are brown.

The specimens were preserved in spirits.

	Inches.	Lines.
Length from nose to root of tail	6	6
" of the tail	6	5
" of ear		7½
Width of ditto		6
Length of fore foot, without the nails ...		9
" of middle finger, without the nail ...		4
" of the hind foot to the base of the middle toe	1	1
" of the middle toe, without the nail ...		5
Greatest breadth of the foot, which is in the middle		6

Of a larger specimen the head and trunk of the skeleton (measured in a straight line) was 7″ 8‴; and the series of caudal vertebræ, also, 7″ 8.‴

Loncheres semivillosa.

Nelomys semivillosus. Is. Geoff., Ann. des Sci. Nat. x. p. 125 (1838); Magas. de Zool. 1840, Mammifères, pp. 42 and 50, Pl. 23 (animal); and Pl. 28, figs. 7, 8, and 9, (the teeth).

Loncheres semivillosa. Wagn. Schreb. Suppl. iii. p. 338.

Tail equal to the head and body in length, moderately well clothed with fawn-coloured hairs, but these not hiding the scaly skin: body rufous-brown, freckled with yellow; under parts white, slightly suffused with rufous: moderately strong spines on the upper parts and sides of the animal.

Inhabits New Granada.

The flattened spines, which are found mixed with the hairs to form the clothing of this animal, are very numerous on the back, and are nearly an inch in length, and somewhat less than $\frac{1}{25}$th of an inch in width on this part: many of the

spines (especially on the hunder parts of the body) are black towards the point, yellowish at the point, and horn-coloured at the root; others again (chiefly on the fore parts of the body) have the terminal half entirely of a blackish or dusky hue. On the upper surface of the head, as well as on the thighs, the spines are narrower than those on the back, and on the under parts of the body, hairs only are found. A very small portion of the tail, and that at the base, is covered with coarse hairs, being some few spines intermixed, and the remaining portion of the organ is moderately well furnished with fawn-coloured hairs, which, however, do not entirely hide the scaly skin beneath.

	Inches.	Lines.
Length from tip of nose to root of tail, very nearly	7	9
" of tail	7	9
" of hind foot and nails	1	4

From *Loncheres armata* and *L. didelphoides*, M. Geoffroy distinguishes this species by its tail being relatively longer; and, moreover, that author notices differences in the spines: thus the spines of *L. semivillosus* are said to be much narrower than those of *L. armata*; and, whilst in *L. didelphoides* the spines on the back are but a trifle narrower than those in the same part of *L. semivillosus*, there is a marked difference in the spines on the head, since in the former animal they do not surpass $\frac{1}{5}$th or $\frac{1}{6}$th of a *millemètre* in width, whilst in the latter they are nearly half a *millemètre*[1].

The above differences, however, M. Geoffroy observes, he should not have considered sufficient to establish his species, were it not that they are combined with certain modifications in the structure of the molar teeth.

[1] Close upon $\frac{1}{50}$th of an English inch.

Loncheres grandis.

Loncheres grandis. (NATTERER) WAGNER, Wiegm. Archiv für Naturgeschichte 1845, Pt. 2, p. 146.

Upper parts of the animal of a golden-fulvous hue, freckled with black; under parts yellowish; head black, slightly sprinkled with fulvous; feet brown: spines flexible. Length of head and body 11 inches (WAGNER).

With regard to this species, Dr. Wagner states that he has been induced to arrange it in the genus *Loncheres*, on account of a near affinity which it seems to evince to the *Loncheres cristata*, but that he had not been able to examine the skull and dentition of the only specimen which had come under his notice. The specimen was brought from the neighbourhood of the Amazon River by Dr. Natterer.

Loncheres macrura.

Loncheres macrura. (NATTERER), WAGNER, in Wiegm. Archiv für Naturgesch. 1842, vol. i. p. 360.

Tail nearly equal to the head and body in length, and provided with very short, scattered, white hairs: general colour of the animal inclining to fulvous, but palish on the sides; under parts of a hoary yellowish cast. Length of head and body together, 10¾ inches; of tail, 10 inches.

Inhabits Borba, Brazil.

Loncheres nigrispina.

Loncheres nigrispina. (NATTERER), WAGNER, l. c. p. 361.

Tail, excepting at its thickened base, densely and equally clothed with brown hairs, and without tuft at the extremity: upper

parts of the animal of a glossy fulvous-brown, but with a sprinkling of black; feet and under parts yellowish white; sides of the snout yellowish hoary. Length of the head and body taken together, 9¼ inches; of the tail, 6 inches.

Inhabits Ypanema, Brazil.

Loncheres unicolor.

Loncheres unicolor. (Rüppell) WAGNER, l. c. p. 361.

General hue of an uniform palish ferruginous brown on the upper parts of the animal; the under parts, as well as the feet, still paler: tail furnished with long hairs: fur of a crisp and harsh nature; that on the back with an admixture of narrow, flattened, and grooved spines. Length of head and body, 10″ 9‴; tail, 7″ 9‴.

Inhabits Brazil.

Sub-genus, *Isothrix.*

Echimyina with the fur soft, and destitute of intermixed, flattened spines: dentition and general aspect as in the species of *Loncheres*[1].

LONCHERES (*Isothrix*) PICTA.

Bicoloured Loncheres.

(*Plate* 19, fig. 1.)

Nelomys pictus. PICTET, Notices sur les Animaux Nouveaux ou peu connus du Musée de Genève, 2de livr. p. 29, Pl. 7 (animal); and Pl. 8, the skull and other parts.

[1] The dentition of the species of Isothrix, according to Dr. Wagner, approaches that of the *Echimys*, and yet presents essential modifications, in which it perfectly agrees with the *Nelomys pictus* of M. Pictet, but upon referring to the last-mentioned author's description and figures of the dentition of *Nelomys pictus*, I cannot perceive any points of distinction between its dentition and that of other species of *Nelomys* (or *Loncheres*, as the group is designated in this work). The mere presence or absence of spines,

Brownish white; a large oblong brown patch on the upper surface of the head; back and shoulders, as well as the tail, brown; but the latter, with the terminal portion, and likewise the basal portion beneath, dirty white: tail rather longer than the head and body taken together.

Inhabits Bahia—Brazil.

According to Prof. Pictet's description, nearly the whole of the head of the *L. picta*, as well as the neck, a great portion of the sides of the body, and the whole of the under parts, are dirty white, but irregularly and indistinctly suffused with brown, arising from the hairs on these parts being brown at the base, and white on the external half only[1]. The back of the animal, and the upper surface of the head, are for the most part clothed with hairs, which are pale brown at the root, and dark brown externally The brown on the head assumes the form of an oblong patch, which is pointed before and behind, and expanded between the ears, which,

or flat, stiff hairs, is certainly of very trivial importance, since animals agreeing otherwise in all essential particulars, differ much with respect to the size and strength of the spiny hairs which are mixed with those of the ordinary fur: they present, in fact, all the intermediate conditions, not only in the *Loncheres* section, but likewise in the genus *Echimys*.

[1] The perusal of Prof. Pictet's description of the colouring of the fur of the *Nel. pictus* strongly reminds me of certain abnormal conditions of colouring which I have noticed in several species of Rodents. Thus, in the British Museum, is a specimen of the *Oxymycterus hispidus* of Pictet, in which there are two large dirty white patches covering nearly the whole hinder parts of the animal, but separated in the mesial line of the back by a longitudinal band of the ordinary brown colour. The hairs on these patches are grey at the root like those on other parts of the animal, and mixed with them are a few hairs which are coloured entirely like those of other parts. This specimen is from the same locality as the *Nel. pictus*, and was accompanied by others presenting the usual colouring of the species. Again, M. Gervais, in the Voyage de la Bonite, figures and describes a specimen of the *Phlæomys Cumingii*, in which the muzzle, ears, and tail, are the only parts which present the dark brown colouring usual in the species, the remaining parts being dirty white, but, as in the *Nel. pictus*, the hairs are white at the points only; and, a condition between this and the normal one is exhibited by a specimen in the Museum of the Zoological Society; in this, the colours are disposed nearly as in the *Nelomys pictus*

however, it does not reach. The line of separation of the brown and white on the sides of the body, commences at the elbow, and as it runs back, gradually ascends, until it reaches the root of the tail. On the fore parts of the body the line of separation of the dark and pale colours forms a curve, running backwards and upwards on either side from the shoulders, across which the brown descends in the form of a moderately broad band, to terminate on the middle of the fore-arm. The feet are covered with stiff, whitish hairs. The tail is rufous-brown above, at the base, and whitish beneath at the same part, the white being extended about two inches lengthwise, and the brown about an inch and a half; a space of three inches, or rather more, of the tail—being the terminal portion—is white above, and golden yellow beneath, and the intermediate portion of the organ is of a very dark brown: it is thick, and has a scaly skin; the scales, however, are hidden by the long and dense hairs.

	Inches.	Lines.
Length from tip of nose to root of tail ...	10	8
" of tail	12	10
" from nose to ear	2	0
" of ear		7½
Width of ditto		7½
Length of fore foot	1	1
" of hind foot	1	10½

The following species of the *Isothrix* section are only known to us through the brief descriptions published by Dr. Wagner, in the Archiv für Naturgeschichte, Part 2 for 1845, p. 146. They constitute part of the great collection formed by Dr. Natterer in Brazil.

Isothrix bistriata (Natterer) Wagner.

Above, varied with black and yellow, beneath yellowish; head with two black bands; tail long and hairy, black, with the base yellow. Length of head and body together, 11 inches; of tail, 10¼ inches.

Inhabits Rio Guapore.

Isothrix pagurus (Natt.) Wagner.

Fore parts of the animal variegated with straw-yellow and black, the hinder parts with rust colour and black; under parts yellowish; snout fulvous on the upper surface. Head and body, 8″ 10‴ in length.

The tail is wanting in the specimen described by Dr. Wagner, but he thinks its absence is accidental. The skull and dentition of this species are said to agree in their structure with the same parts in the *Isothrix bistriata*. It inhabits Borba.

Isothrix pachyura (Natt.) Wagner.

Above variegated with black and dirty yellow; beneath pale yellowish; tail densely clothed with hairs; above, brown, beneath yellow-white. Head and body, $10\frac{1}{6}$ inches; tail (perhaps not perfect), $6\frac{3}{8}$ inches.

Dr. Wagner states that the skull of this animal is unknown to him, but he considers the species as identical with the *Nelomys antricola* of Dr. Lund[1].

[1] It may here be observed, that Dr. Lund, in his papers on the Fossil Mammalian Remains discovered in the caverns of Brazil, divides the old genus *Echimys* into four genera; viz. *Phyllomys*, *Echimys*, *Loncheres*, and *Nelomys*—see Det Kongelige Danske Videnskabernes Selskabs Naturvidenskabelige og Mathematiske Afhandlinger, vol. viii. p. 243 (1843). Of these, it is only necessary to remark that—

Phyllomys is in all essentials the same as *Loncheres* of Illiger.
Echimys, Lund, is *Dactylomys*, Is. Geoffroy.
Loncheres, Lund, is *Echimys*, Is. Geoff. and others.

In the genus *Nelomys*, Dr. Lund includes two species—*Nelomys antricola*, a living species, and *N. sulcidens*, hitherto found only in a fossil state: on their dentition, and other characters, some remarks will be found under the head *Echimys antricola*.

The genus *Phyllomys* is established by Dr. Lund upon some upper jaws found in the Brazilian caverns, belonging to species still living, but which the Danish naturalist does not appear to have met with. The dentition of the animal (to which the specific name *Braziliensis* is given) departs slightly from

Genus, *Mesomys*.

Mesomys. Wagner, Archiv für Naturgesch. 1845, p. 2, p. 145.

In general aspect resembling the species of Loncheres: teeth like those of an Echimys; body armed with strong spines; tail wanting.

Whilst the form of the head, ears, and feet, are entirely as in *Loncheres*, the dentition fully agrees with that of *Echimys fuliginosus*. This animal is hence intermediate in its character between the genera *Loncheres* and *Echimys*: from both, however, it is distinguished by the want of a tail, which, according to Dr. Natterer, is not an accidental peculiarity[1].

Mesomys ecaudatus. Wagner, in Archiv für Naturgesch. 1845, Pt. 2, p. 145.

Upper parts of the animal fulvous, sprinkled with black; under parts ochraceous. Length of body, 6″ 8‴.

Inhabits Borba, Brazil.

The above account, which is from Dr. Wagner, leaves further details desirable.

the typical species of *Loncheres*, inasmuch as the crown of each molar tooth is divided by grooves into four narrow transverse plates. A fossil species, also placed by Dr. Lund in the genus *Phyllomys*, presents an intermediate condition in the structure of its molars, some of the transverse plates being united in pairs. It may be necessary to explain that the floors of the caverns alluded to are strewed with an abundance of bones of small Rodents, of species still inhabiting the district; these having been conveyed there, Dr. Lund informs us, by certain animals of prey, and more especially by a species of owl.

[1] It would have been well had Dr. Wagner stated whether more than one specimen of this species has been found, for it is difficult to conceive that the absence of a tail should not have been accompanied by modifications in the structure of the feet and other parts, unless that absence were accidental.

Genus, *Echimys*[1].

Echimys. (Geoffroy) Desm., in Nouv. Dict. d'Hist. Nat. x. p. 54 (1817)
—Mammalogie, p. 290.
Echinomys. Wagn., Schreb. Säugth. Suppl. iii. p. 339.

Echimyina with the feet narrow and moderately long; upper molar teeth with one internal indenting fold of enamel, and one or two folds on the outer side.

Representatives of the genus Echimys are found from the northern parts of South America, southwards as far as Paraguay: they extend in the western direction, into Peru and Bolivia, but do not occur on the west side of the Andes.

The species of Echimys usually have the ears larger than those of the *Loncheres* division; their feet are longer and narrower, and have the toes, as I have already observed, more unequal in length; the muzzle, moreover, is longer, and pointed; whilst in *Loncheres* it is short, and somewhat obtuse. To these differences we have to add certain modifications observable in the structure of the molar teeth, and in the form of the palate. With regard to the latter, there is a tolerably well-marked point of distinction in the skulls of the species of the two genera: thus, in *Loncheres*, that portion of the palate which lies between the molar teeth, is long and narrow, whilst in *Echimys* the same part is short, and relatively broad: in both, the series of teeth on opposite sides of the jaw converge slightly in front. The broader and shorter palate of the Echimys arises from the proportionately small size of its molars[2].

[1] From ἐχῖνος, the sea-urchin, or the hedgehog; and μῦς, a mouse or rat: *Echinomys*, as Prof. Wagner observes, would have been a more correct compound.

[2] Upon comparing the molar teeth of the *Loncheres Blainvillii* with those

The structure of the molar teeth in the Echimys (Pl. 16, figs. 1 and 1 A) is more simple than in the Loncheres: each upper molar has a deep internal fold, which divides the tooth into two unequal parts; the foremost, which is narrow and transverse, is the smaller; the hinder portion approaches somewhat to a triangular figure; broad externally, and almost pointed on the inner side; within it are seen two small transverse areas, surrounded by enamel, in the first and second molars, and but one transverse area in the third, as well as in the corresponding division of the lower molars (Pl. 16, fig. 1 B), which resemble the upper, excepting that they are (as usual) reversed in position, and that the foremost lower molar has a small extra lobe in front, partially separated by a small transverse area. In these molar teeth of the lower jaw, the primary fold of enamel in traversing the body of the tooth runs obliquely upwards, whilst in Loncheres it takes an opposite direction[1].

of the *Echimys Cayennensis*, I find that the series of these teeth in the upper jaw of the latter animal occupy one-third less space in the longitudinal direction, and in relation to the size of the skull, than they do in the *Loncheres*.

[1] The letters added to the figures of the molar teeth represented on Plate 16, are intended to indicate the corresponding folds of enamel in each. The primary internal fold is marked *a*, the principal external fold *a* 1, and the secondary folds, *b* 1 and *b* 2. Of these folds the primary internal one is the deepest, and consequently the last to be obliterated by the wearing of the crowns: it is the most constant in Rodents. When the folds *a* and *a* 1 both penetrate deeply into the body of the tooth, the latter almost invariably passes behind the former, and this circumstance would lead one to believe that in the molar of the Echimys, the foremost of the two small areas in the hinder division of the tooth represents the fold *a* 1; in which case, the second small area would represent the fold *b* 2. An examination of the teeth of several species of Echimys, both in the adult and young states, will no doubt enable us to determine these points, without which we cannot properly appreciate the distinctions which separate the molars of Echimys from Loncheres.

ECHIMYS CAYENNENSIS.

Cayenne Echimys.

(*Plate* 19, fig. 2).

Echimys Cayennensis.	(Geoff.) Desm., Nouv. Dict. d'Hist. Nat. x. p. 59 (1817); Mammalogie, p. 292 (1822).
" "	Is. Geoff., Magas. de Zool. année 1840, pp. 13 and 52.
" "	Pictet, Mém. de la Soc. de Phys. et d'Hist. Nat. de Genève, ix. p. 145. Pls. 1, 2, and 3, and Pl. 4, skeleton (1841-2).
" *setosus.*	(Geoff.) Desm. Nouv. Dict. x. p. 59.
" *myosuros.*	Licht., Abhand. der Königl. Akad. der Wissensch. in Berlin, 1818-19, p. 192, Pl. 1, fig. 2.
" *leptosoma.*	(Licht.) Brants, Het Geslacht der Muizen, p. 150, (1827).
Mus cinnamomeus.	Licht., Darstell. Part 7, Tab. 36, fig. 2 (1832).
Loncheres anomala.	Kuhl, Beiträge zur Zoologie, p. 72 (1820).
" *Cayennensis.*	Fischer, Synopsis Mammalium, p. 307 (1829).
? *Echimys longicaudatus.*	Rengger, Naturgesch. der Säugth. von Paraguay, p. 236 (1830).
Echinomys leptosoma.	Wagn., Schreb. Säugth., Suppl. iii. p. 341 (1843).

Tail nearly as long as the head and body together; ears large; tarsi long; upper parts of the body chiefly covered with spines; sides likewise with spines, but with a considerable admixture of hairs: upper parts of the animal of a dusky brown colour; sides of the body, and more especially of the head, suffused with rufous; under parts white.

Inhabits Guayana and Brazil.

M. Pictet, who has furnished the most perfect account of the characters of this animal, calls attention to the absence of spines, as characteristic of the young animal up to the time that three molar teeth only are developed in each series, and that the animal measures about eleven inches in length, without including the tail. Its colouring, then, differs only from that of the adult in having an admixture of grey with the brown of the upper parts, and in having the feet of a less pure white. In this stage the animal, M. Pictet states, cor-

responds very nearly with the specimen upon which M. Geoffroy founded the *Echimys setosus*.

In a still more advanced stage, when the fourth molar begins to make its appearance, the animal still exhibits the greyish hue on the upper parts of the body, as in the first stage mentioned, but a slight rufous tint is visible on the cheeks, and the white on the under parts is more pure, and more distinctly separated from the brown hue of the upper parts. Spines also make their appearance, but as yet confined to the back of the animal.

In 1837, I examined a specimen of the *Echimys Cayennensis* preserved in the Paris Museum, which, agreeing very closely with Desmarest's description, and being deficient in a portion of its tail, as mentioned by that author in his account, is no doubt the original of his description[1]. It is about equal in bulk to the Black Rat (*Mus Rattus*); of a brownish yellow colour; dusky on the back, and white on the whole of the under parts of the head and body: the lower part of the muzzle, the fore feet, and the inner side of the hind feet, as well as the toes, are also white: the outer surface of the tarsus is brownish; the moustaches brown; the tail brown above, pale below, and clothed with short hairs, excepting at the apex, where they are about a quarter of an inch in length. Bristly, flattened hairs cover the shoulders and haunches, and strong, grooved spines, with a few intermixed hairs, cover the back. The brown-yellow colour of the sides of the body forms a well-marked line at its junction with the white of the under parts. Length from tip of nose to root of tail, 7″ 7‴; of the ear, 7‴; of the tarsus, 1″ 9‴. The imperfect tail

[1] The length of the animal, measured from the tip of the nose to the root of the tail, I found to be about an inch more than in the admeasurement given by Desmarest, but such a difference would occur were the animal measured in a straight line, in one case, and along the curve of the back (as it is my practice to do), in the other.

measures 5″ 6‴ : a very small portion only appears to have been lost.

Of the adult animal, the British Museum collection contains several specimens; they vary but little in their colouring: the general hue of the upper parts of the body is dusky brown, and sometimes the brown assumes a slight vinous or purple tint: on the sides of the body, and on the head, a rufous tint prevails—sometimes very bright, and inclining to yellow; and the under parts of the body, the lower half of the muzzle and cheeks, as well as the inner side of the fore legs, the fore part of the hind legs, and the feet, are white; generally very pure, and the hairs on these parts are uniform to the root. The white of the under parts of the animal, and the rufous tint on the side of the body, form a well-marked line where they meet, not gradually blending, as is often the case. The upper surface of the head is pencilled with black; the region of the eye is dusky, and the hairs of the moustaches brown; behind each ear is a rufous white, or pale rufous patch: the ears are tolerably large, and distinctly emarginated behind; of a whitish colour, but broadly margined with dusky; they are rather sparingly clothed with brown hairs, which are for the most part very short, but on the anterior margin, and on the inner surface immediately behind the opening, they are long. A slight pencilling of brown is observable on the sides of the body: the hind legs are dusky externally, especially near the heel; the tail is dusky above, and dirty white beneath, and the small hairs, with which it is for the most part scantily clothed, are of the same colour as the part from which they spring; towards the apex of the tail the hairs become longer, and at the point they are about half an inch in length; here they are entirely of a dirty white colour. The spines on the back of the animal average about ten or twelve lines in length,

and two-thirds of a line in width; they are nearly white at the root, and shaded through grey into dusky-brown externally; the extreme point, however, is often of a paler tint, inclining to rufous. On the sides of the body the spines are less strong, and have the exposed end of a paler brown colour, and those on the haunches are pale yellow-brown at the apex—sometimes almost white. Spines, with a few hairs intermixed, cover the upper parts of the body; on the flanks and haunches the hairs are fully as numerous as the spines, and on other parts the spines are wanting. This description applies very closely to all the stuffed specimens in the British Museum, excepting that in one or two there is a faint yellow tint on the under parts. In the same Museum are two specimens (a male and female) preserved in spirits, and which were procured in the province of Minas Geraes; they appear to me to be without doubt identical in species, not only with the *Echimys Cayennensis*, but likewise with the animal described by Dr. Lund, from the same part of Brazil, under the name *Loncheres elegans*. In the female specimen I could discover but two mammæ; these were very distinct, placed one on each side of the body, about midway between the fore and hind legs, and exactly on the line which marks the separation of the yellow colour of the flanks, from the white of the under parts. The soles of the feet are of a dusky purple hue; the tarsus is remarkably smooth beneath, and the under surface of the toes presents numerous deeply-indented transverse incisions. The flesh of the ears is whitish, but these organs are very broadly margined with dusky.

The examination of several specimens (clearly of the present species) contained in the Leyden Museum, convinced me that the absence of spines in some parts of the body which are usually covered by them, is not always a mere indication of immaturity, but that, at certain seasons of the year, they are cast to be again replaced; for in one of the

largest specimens, I found the spines almost entirely confined to the middle of the back: in a second, they covered the hinder half of the back, and extended to the root of the tail; on the remaining upper parts of the body were stiff hairs. The latter specimen is of a bright brownish rust colour, pencilled with brown-black on the back; the feet and under parts white; fore legs also white, excepting on the outer side, where they are coloured like the sides of the body, and in the region of the wrist, where they are dusky, as are also the hind legs, immediately above the heel; the thighs brown externally, white in front, and pale rufous internally[1]. The first of the two specimens alluded to, differed from the second in having the feet, and lower parts of the legs, both externally and internally, of an uniform pale rufous-brown; and in having the abdomen yellow-white[2]. These specimens are from Surinam.

[1] Its admeasurements are given in the fifth column.

[2] Admeasurements in the sixth column; its tail measured 6″ 2‴, but a small portion was wanting.

	Bahia. British Museum.		Bahia. Zoological Soc.		Minas Geraes. MALE. British Museum.		Minas Geraes. FEMALE. British Museum.		Surinam. Leyden Museum.		Surinam. Leyden Museum.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines	Ins.	Lines.	Ins.	Lines.
Length from tip of nose to root of tail	9	3	8	6	8	4	8	0	8	8	10	6
" of tail	8	6	8	3	8	0	7	7	7	7		
From nose to ear	1	10	1	9½	1	9	1	9				
Length of ear		8		8		9		9½		8		7¾
Width of ditto at the base		10		9½		10		10				
Length of fore foot and nails		9½		9¾		10		10				
" of hind foot and nails	1	11	1	11⅓	1	10½	1	10½	1	10½	1	10
" of skull (to hinder part of auditory bullæ) ...	1	11⅓	1	10½								
Width of ditto	1	0	1	0								
" between orbits		5½		5¼								
Length of nasal bones		9		8½								
Width of ditto behind		2		2								
" " in front		2½		2⅔								
From incisors to molar teeth		5½		5								
Length of four upper molars, taken together		3¾		3¾								
" of lower jaw	1	1	1	1								
Height of ditto, from the condyle		5¾		5½								

Echimys setosus. (Geoff.) DESM.

About equal in size to the Common Rat (*Mus decumanus*); general hue bright rusty yellow, the back suffused with brown;

under parts, as well as the feet, white, with a very indistinct yellow cast: tail with scattered brownish white hairs, which are rather longer than in the Common Rat, and, near the apex, about half an inch in length. Spines are mixed with the hairs on the back of this animal, but are almost entirely hidden by the hairs; they are of a very pale grey-brown (almost white) at the root.

	Inches.	Lines.
Length from tip of nose to root of tail ...	7	10
" of tail (a small portion is wanting) ..	6	9
" of hind foot and nails	1	10
" of ear, about		6¾
" from nose to ear		6½

The above description is from the original specimen described by Desmarest, in the Paris Museum. The author just mentioned has undoubtedly (as pointed out by M. Isidore Geoffroy) committed an error in giving 5″ 6‴ (French measure), as the length of the animal, exclusive of the tail.

According to M. Isidore Geoffroy, the spines of this animal are less numerous than in the *E. Cayennensis*, and differ, moreover, in being narrower, longer, and less stiff, and hidden by the hairs forming the ordinary fur. The habitat of the specimen is not known, but M. Geoffroy states that the Paris Museum has received two specimens perfectly agreeing with it, excepting in being rather smaller, both of which are from Brazil—one was brought from Rio Janeiro by MM. Quoy and Gaimard. I am quite inclined to agree with M. Pictet's opinion with regard to the *E. setosus*—that it merely presents an immature condition of the *E. Cayennensis*. In proportion as the spines are more developed in this animal, the hairs with which they are mixed become more scanty—the growth of the former must, in fact, be at the expense of the latter.

Echimys longicaudatus. Rengger.

The *Echimys longicaudatus* of Dr. Rengger is regarded by several

mammalogists as identical with the *E. Cayennensis*, but whether this view be correct, can scarcely be determined from the very brief account given in the "Saugethiere von Paraguay." Dr. Rengger states that the *E. longicaudatus* (which was procured in the northern part of Paraguay) agrees perfectly with his *E. spinosus*, excepting that its tail is longer, that the cheeks are reddish brown, the head, neck, back, and outer side of the limbs brown, and the points of the spines pale reddish brown. Head and body, 8 inches; tail, 6″ 4‴.

Echimys fuliginosus.

Echimys fuliginosus. WAGNER, Schreb. Säugth. Suppl. iii. p. 343.

General hue of the upper parts of the animal blackish brown; sides of the body pale brown; feet and under parts white; narrow bristles on the back, and still narrower bristles on the sides of the body: tail rather shorter than the head and body together.

Inhabits Brazil.

This is most probably, as Dr. Wagner now supposes, a variety of the *E. Cayennensis*, differing from the ordinary conditions of that animal in the absence of the rufous colouring, and in having the spines narrower, these being about ten lines in length, and half a line in width.

	Inches.	Lines.
Length from tip of nose to root of tail ...	8	10
" of tail	7	8
" of ear		10
" of hind foot and nails	1	9

I only know this animal through Dr. Wagner's description.

ECHIMYS ALBISPINOSUS.

White-spined Echimys.

Echimys albispinosus. Is. GEOFF., Guér. Mag. de Zool. année 1840, pp. 33 and 56, Plate 26,—molar teeth, Pl. 29, figs. 1, 2, and 3.

Tail scaly, and with short hairs; head, upper parts and sides of body, with spines, those on the upper parts black at the extremity, and those on the flanks white: general hue of upper parts brown, and of the flanks, rufous; the whole under parts are pure white.

Inhabits Bahia, Brazil.

With a general resemblance to the *Echimys Cayennensis*, this species, according to M. Geoffroy, is distinguished from that animal by the presence of spines on the head, as well as on all the parts of the body, excepting those which are white; the white colour of the spines on the flanks, moreover, forms one of its distinguishing characters—the one which suggested the specific name. The spines are as strong as those of the *E. Cayennensis*, but much less so than in the *E. hispidus*; those on the upper parts are greyish at the root, and black at the point, and it is the mixture of the black with the rufous interspersed hairs which produces the brown hue on these parts; whilst on the sides of the body, as well as the thighs and haunches, the rufous ground-colour has on it a white pencilling, arising from the protruded points of the spines; some of the spines, however, on these parts are of a very pale grey at the tip. The ears are naked, and tolerably large; the limbs are of a brownish grey colour; the fore foot, the toes of the hind foot, and part of the tarsus, are white. The tail is brown above, whitish below, where the hairs, which spring from between the scales, are also whitish; those on the upper surface of the tail are black.

	Inches.	Lines.
Length from tip of nose to root of tail ...	7	3
" of tail	5	11
" of hind foot	1	9

ECHIMYS HISPIDUS.

Strong-spined Echimys.

Echimys hispidus.	(Geoff.) DESM., Nouv. Dict. d'Hist. Nat. x. p. 58; Mammalogie, Pt. 2, p. 292.
" "	IS. GEOFF., in Guér. Mag. de Zool. année 1840—Mammifères, pp. 9, 35, and 54, Pl. 27—molar teeth, Pl. 29, figs. 4, 5, and 6.
" "	PICTET, Mém. de la Soc. de Phys. et d'Hist. Nat. de Genève, ix. p. 156, Pl. 5.

About equal to the Black-rat (*Mus Rattus*) in size; tail very nearly equal to the head and body in length, and well covered with longish hairs, excepting at the base; ears small: broad and strong spines cover the whole upper parts and sides of the animal, commencing on the back of the head; upper parts rusty-brown; feet, sides, and under parts of the body, rust-coloured.

Inhabits Bahia, Brazil.

The above, which are the leading characters of the *E. hispidus*, are extracted from my notes made upon the original specimen contained in the Paris Museum, from which notes, I may further add, that the hairs on the head are stiff, bristly, and grooved along the upper surface, and that the broad spines, which are pale at the root, and of a rusty-brown colour beyond, commence behind the ears, and cover not only the whole of the upper parts of the body, to the root of the tail, but extend *full* half way down the sides of the body. The hairs of the tail are of a yellowish brown colour; at the base of the organ they are short, and do not hide the scaly skin, but they gradually become longer and more numerous to the point, at which part they are upwards of half an inch in length.

The Paris specimen has been in that museum for many years, having originally been brought from the museum at

Lisbon, and is no doubt somewhat changed in its colouring; I will therefore extract some portions of M. Pictet's detailed description of an adult male specimen, contained in the Geneva collection, and which has recently been procured from Bahia. The spines on the upper parts of the body, in M. Pictet's specimen, are white on the lower half, then inclining to violet-grey, and at the apex they are of a bright fawn-colour[1]; the general hue of the upper parts is of a deep chestnut-brown. The head is covered above with narrow spines, as in the Paris specimen, and the broad spines are found covering the same parts as in that specimen, excepting that the neck is said to be armed with narrow spines like those on the head; the upper surface of the head, and the upper lip, are brown; the cheeks fawn-colour; the ears rather short, rounded, and with long hairs on the margin; the moustaches black. The outer surface of the hind legs presents a mixture of flexible spines and hairs, but on the lower half the legs have hairs only. The fore legs are whitish internally, and covered externally with hairs, which are brown at the base, but passing into yellow at the opposite extremity; the toes are grey-white: the hind feet are similarly coloured. In both fore and hind feet the middle and fourth toes are equal, whilst the second and fifth are shorter than these by the length of a joint. The under parts of the body are of a pale fawn-colour, or even whitish, this colour being gradually blended with the colour of the flanks; the lips, under surface of the neck, and the lower jaw, are nearly white. The tail is clothed with deep brown hairs, excepting on the under surface of the basal portion, where they are pale.

[1] M. Pictet gives the width of these spines as somewhat more than a *millemètre*; in this I fear there is some mistake; I feel certain, at least, that the spines in the Paris specimen are very much broader than this measurement indicates: I regret I am not able to give the actual size.

	Paris specimen. Inches.	Lines.	M. Pictet's specimen. Inches.	Lines.
Length from tip of nose to root of tail	7	6	7	11
" of tail	7	3	7	10½
" of head			2	0
" of ears		3½ [1]		7
" of fore foot				8
" of hind foot	1	2	1	3¾

ECHIMYS BRACHYURUS[2].

Short-tailed Echimys.

Echimys spinosus.	DESM., Nouv. Dict. d'Hist. Nat. x. p. 57 (1817); Mammalogie, p. 291 (1822).
? " "	RENGGER, Naturgeschichte der Säugth. von Paraguay, p. 234 (1830).
Mus spinosus.	LICHT., Darstell. Pt. 7, Pl. 36, f. 1 (1832).
Loncheres rufa.	LICHT., Abhandl. der K. Akad. der Wissenschaften in Berlin, 1818—1819, p. 192, (1820).
Echinomys brachyurus.	WAGNER, Schreb. Säugth. Suppl. iii. p. 346, (1843).
Rat premier, ou *Rat épineux.*	AZARA, Essais sur l'Hist. Nat. des Quad. de Paraguay ii. p. 73 (1801).
Échimys roux.	CUV. Règne Animal, i. p. 195.

Spines narrow, and hidden by the fur; ears moderate; tail about as long as the body; tarsus long: general colour rich brown (pencilled black and rufous); under parts dirty white; feet dark brown.

Inhabits Paraguay and Bolivia.

[1] According to my notes, the ears are "about" 3½'''. I presume their condition did not admit of accurate measurement.

[2] The name *brachyurus* applied to this species, is referred, by Dr. Rengger, to Illiger, but I cannot discover where this last mentioned author has published it; I, however, follow Dr. Wagner's example in adopting this name, not only because it is more appropriate than that of *setosus*, but because the latter too nearly resembles the names given to other species of *Echimys*, a circumstance which has been found very perplexing to others as well as myself.

Two specimens of a Spiny-rat, or Echimys, brought by Mr. Bridges from Bolivia, agree so closely in all essential points with Azara's description upon which the *Echimys spinosus* of authors has been founded, that I do not hesitate to introduce their characters under this head. The larger of the two specimens is scarcely equal to the Black Rat (*Mus Rattus*) in size, and both specimens agree in having a comparatively short tail, and in being, to all appearance, destitute of spines,—characters which at once separate them from all the preceding species here described. The fur on the sides of the body is tolerably long, glossy, and moderately soft, and each hair, below the exposed portion, is of a brownish ash colour, but very pale, and, indeed, almost white towards the root; near the point the hairs are of a rich rufous tint, and at the point they are dusky; the general hue produced by the mixture being rufous-brown: on the back, the general hue is of a deeper brown, owing to the hairs being black at the point, instead of brownish or dusky; the rufous pencilling is, however, still very distinct on this part: here there is, mixed with the ordinary fur, an abundance of stiff bristly hairs, averaging about 9 lines in length, and one-quarter of a line (or $\frac{1}{48}$th of an inch) in width; they are grooved along the upper side, as usual in the Spiny Rats, almost white at the root, and gradually shaded through brown into black, which is the colour of the exposed ends. That the animal appears to be destitute of spines, arises from the circumstance that each of the spines terminates in a long and extremely slender hair; the slender end, in many cases, being equal to one-fourth of the entire length of the spine, and in all is the only portion visible, until the fur is parted. The head is dark brown, with but a slight trace of the rufous pencilling on the upper surface; the chin, throat, and abdomen, are white, with a faint yellowish cast; on these parts the hairs are somewhat scanty and short, and they are uniform in colour throughout

their length; the limbs are brown externally, and the feet are dusky brown; the tail is dusky above, and pale beneath, and clothed throughout with very small hairs, which are not sufficiently numerous to hide the scaly skin. The ears are sparingly clothed with brownish hairs; the moustaches are brown black, or some few of the hairs pale brown; the *incisor teeth pale orange colour in front.*

					From Azara.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length from tip of nose to root of tail ...	5	10	6	6	7	8
" of tail	3	0	3	10	3	0
" of hind foot and nails	1	5	1	7	1	6
" of ear		5		5½		4½

Mr. Bridges obtained the two specimens alluded to, from the neighbourhood of the village of Chinoré, on the north side of the Andes of Cochabamba.

The four specimens which came under Azara's notice, were procured at Atira, which is situated about eight leagues to the east of Assumption, in Paraguay.

The burrows of the animal are excavated in a sandy soil, and are often found closely approximated: a burrow of this Echimys, opened by Azara, was four feet in length.

Echimys spinosus. RENGGER.

The Echimys described by Dr. Rengger as the "*Rat épineux*" of Azara, must either be a distinct species, or we must conclude that all the specimens examined by Azara, as well as the Bolivian specimens described by myself[1], were imma-

[1] And I may further add, that Dr. Lichtenstein's description of a specimen, said to be from Brazil, agrees closely, in all essential points, with the individuals which I have examined.

ture, and that the form of the spines alters with age, since Dr. Rengger states of his *E. spinosus*, that he has never observed the spines terminate in a long hair-like point in that animal, as noticed by Azara, and as I find to be the case in the Bolivian specimens. With regard to these latter, I must observe, moreover, that in them the spiny hairs are strictly confined to the back: from Azara's description we do not learn whether such was the case in his animal. I will here add an abstract of Dr. Rengger's description.

Upper parts and sides of the body brown, or where the spines exist, brown mixed with brownish red, as the bristles have a brownish red point: throat, breast, belly, and inner surface of the limbs grey-white; tail brownish black. On the whole of the upper parts of the body, as well as on the flanks, the hinder part of the head, and the upper half of the limbs externally, are numerous spiny hairs mixed with those of the ordinary fur, and which project beyond, and almost entirely hide the latter. Length of head, 2″; of trunk, 5″ 6‴; of tail, 2″ 9‴.

Dr. Rengger states that he found this animal in the southern parts of Paraguay only, and that it was there very rare. They live often in great communities on the gentle declivities of sandy hills, where they excavate serpentine burrows of five or six feet in length, and scarcely more than six inches below the surface of the soil. The burrows sometimes have one, and sometimes several outlets; and, at their termination, is a bed or nest of dried grass. In one of the burrows opened, Dr. Rengger found two young spiny Rats: they were blind, and the bristles on the back were quite soft. The food of the Echimys, Dr. Rengger further observes, appears to consist of the roots of grasses, and the seeds and fruits of shrubs, for, in the districts in which it is found, no other vegetable substances suitable for it exist.

ECHIMYS INERMIS.

The Spineless Echimys.

Echimys inermis. PICTET, Notices sur les Animaux Nouv., &c. in Mém. de la Soc. Phys. et d'Hist. Nat. Genève, x. p. 33, Pl. ix. and Pl. x. figs. 1—8.

Feet moderately long; tail rather shorter than the head and body taken together, and clothed with long hairs, which entirely hide the scales; fur soft, and without any mixture of soft hairs; general hue brown-yellow; under parts yellowish white.

Inhabits Bahia, Brazil.

This species, which is readily distinguished from others of its genus by its fur being uniformly soft, has the tarsi considerably shorter than in the *Echimys Cayennensis*, and the outer toe of the fore feet relatively longer: its tail is provided with longer hairs than in other species of Echimys, and they are so abundant as almost totally to hide the scaly skin, especially on the basal part of the organ. Although the fur is soft, that on the back is composed of hairs of two kinds, the one presenting the usual appearance, and the other flattened and grooved like the spines of other species of Echimys: all these hairs have the basal half grey; above this they are brown; at the point they are deep brown, and they have a subterminal pale yellow ring. The muzzle is clothed with hairs which are annulated with brown and white, and the orbit of the eye is white above. The hairs of the moustaches are some of them white, and some black: the region of the mouth, and the under surface of the head, is white, slightly inclining to yellow; the throat has a mixture of grey and yellow colours; the limbs are clothed with hairs which are grey, with a yellow point, and the toes are uniformly grey. The under parts of the body and

inner surface of the limbs are yellowish white. The hairs of the tail are black, excepting those on the under side of the basal half, which are whitish.

A second specimen, examined by M. Pictet, had the fur still softer than the first, and its general tint was more grey. It was killed in the crevice of a rock at Jacobina, in the province of Bahia.

	Inches.	Lines.
Length from tip of nose to root of tail ...	8	0
" of the tail	7	0
" from tip of nose to ear	1	$9\frac{1}{2}$
" of ear		$9\frac{1}{3}$
Width of ditto		$8\frac{1}{2}$
Length of the fore foot		$9\frac{1}{5}$
" of the hind foot	1	$9\frac{1}{4}$

ECHIMYS ANTRICOLA.

The Cave Echimys.

Nelomys antricola. LUND, Det Kongel. Dankse Videnskab. &c. viii. p. 246, Pls. 22 and 23.
Echimys apereoides. LUND, l. c. viii. p. 98.

Body stout; the muzzle thick; ears short; tail long, and well clothed with hairs: upper parts of the animal grey-brown,

[1] Whether Dr. Wagner is correct in identifying his *Isothrix pachyura* with this animal it is impossible to determine, for the accounts given of both animals are far too brief for the decision. Should the *Is. pachyura* prove to be the same as the *Nelomys antricola* of Lund, then must it be placed in the genus *Echimys*, for I must insist upon the structure of the teeth as of higher importance than the more or less hairy condition of the tail, and the other external characters which induce Dr. Wagner to place his animal in the same section as the *Loncheres picta*: that species most decidedly belongs to the section of the Spiny-Rats (the Loncheres section), in which the upper molars have *three* indentations, or folds, of the enamel entering from the outer side. Whether the middle fold of these three joins the principal internal fold or not, is a matter of little importance, when we are simply seeking for the primary type of structure in the part in question. *Echimys antricola*, as I have elsewhere stated, has but *two* folds on the outer side of the upper molars.

with an admixture of rusty yellow; under parts white: the hairs of the fur harsh, and adpressed.

Inhabits the interior of Brazil.

The *Echimys antricola*, briefly described by Dr. Lund in his papers in the Transactions of the Danish Society of Naturalists, &c., is evidently a distinct species, though closely allied to the *Echimys inermis*[1]. Like that animal, its fur is destitute of true spines, and its molar teeth have each but three folds of enamel, two on the outer side, and one on the inner, in the upper molars, and with the folds reversed in the lower molars: but, from the *E. inermis*, it must differ not only in being of a larger size[1], but in having a coarse fur, and a relatively shorter tail.

	Inches.	Lines.
Length from tip of nose to root of tail ...	10	0
" of tail	7	6

Genus, *Carterodon* (fossil).

Echimys et *Aulacodus*. LUND, in the Danish Transactions,

Echimyina with a short and broad skull; the incisor teeth large; those of the upper jaw each with a longitudinal furrow near the outer edge, and a longitudinal mesial ridge, and those of the lower jaw flat in front: molar teeth of the upper jaw with one internal fold of enamel, and two external folds; those of the lower jaw with the same number of enamel folds, but these reversed in position.

Carterodon sulcidens.

Echimys sulcidens. LUND, Det Kongel. Danske Videnskab. &c. viii. pp. 99 and 242, Pl. 25 (lower jaw).

[1] The skull of *E. inermis*, according to Prof. Pictet's figures, measures 2″ 0¼‴ in length, and 1″ in width; whilst Dr. Lund's figures of the skull of the *E. antricola* represent it as 2″ 4‴ in length, and 1″ 2‴ in width. The animal is said to bear a close resemblance to the *Cavia Aperea*, both in size and colouring.

Certain remains of a small Rodent found by Dr. Lund in the caverns in the interior of Brazil, are referred by that author to the genus *Echimys*, and subsequently to that of *Nelomys*, but most recently to the genus *Aulacodus* of Temminck. They consist of portions of skulls and lower jaws, with the teeth; and, from a character furnished by the latter, the specific name *sulcidens* was suggested. Amongst numerous Mammalian remains, from the caverns in the same district, contained in the collection of the British Museum, are several crania of the same species, and from an examination of these, I have satisfied myself that the characters they present do not strictly belong to either of the genera above mentioned. The molar teeth very nearly agree in their structure with those of the Echimys, and can scarcely be said to differ from those of Aulacodus; and, consequently, are unlike the molars of Nelomys (or *Loncheres*). They are relatively larger than in Echimys, broader than long, and remarkable for the thickness of the enamel which covers them; the inner fold of enamel of the upper molars runs obliquely forwards and inwards from the posterior angle of the tooth, and at its termination touches the foremost of the two deep external folds. The upper incisor teeth, in being grooved, differ from those of *Nelomys* and *Echimys*, and they differ, moreover, in being relatively much larger: nor will they bear a very close comparison with the incisors of Aulacodus, for in that animal each upper incisor has three grooves, and these placed on the inner half of the tooth, whereas in the *Carterodon* there is but one groove, and that runs close to the outer edge; this groove is broad, and tolerably deep, and bounded on the inner side by a strongly convex ridge, which runs along the middle of the tooth; the inner half of the tooth is flat; and, what is rather singular, this portion of the anterior surface of the tooth, in a skull before me, is white,

whilst the outer half of the tooth is of a deep orange colour[1]. The fossil skull under examination differs from the skulls of the species of *Echimys* and *Nelomys*, not only by its short and broad form, but in having the zygoma deeper, and the malar bone destitute of a post-orbital process; the infra-orbital opening relatively small, and the incisive openings much larger. From the skull of the Aulacodus it differs, amongst other points, in wanting a separate groove for the infra-orbital nerve, and in being destitute of the strong sagittal and occipital crests, which are so remarkable in that skull. The condition of the fossil skulls alluded to is such, that I am inclined to believe the species may still be living in South America; they have scarcely lost their animal matter, and owe their very perfect state of preservation to a coating of stalagmite, which in some cases is so thin that it is removed without difficulty. I see that Dr. Lund also supposes the animal is still living, for he arranges it amongst the existing species, though he has not yet, as he states, met with it. Skulls and lower jaws of the *C. sulcidens* are abundant in nearly all the caverns visited by Dr. Lund. The following dimensions are taken from one of the most perfect of three crania[2]. It is figured on Plate 16.

	Inches.	Lines.
Total length of skull	1	7
Width of ditto		$11\frac{1}{4}$
" between orbits		4
Length of zygomatic arch		$8\frac{1}{2}$
Greatest depth of ditto		$2\frac{1}{8}$
Length of nasal bones		6
Width of ditto		$2\frac{1}{8}$
" of incisor teeth		$2\frac{1}{4}$
Distances between incisors and molars ...		$3\frac{3}{4}$

[1] A second specimen differs only in having the orange colour replaced by yellow: the colour in this has evidently faded.

[2] Some imperfect skulls are a trifle larger than the specimen measured, and the lower jaw, of which the dimensions are given, apparently belongs to one of these.

	Inches.	Lines.
Length of four upper molars, taken together		4
Height of ant-orbital opening		2⅓
Width of ditto		1⅛
Length of lower jaw	1	1¾
Height of ditto, from the condyle		5½

Genus, *Aulacodus*[1].

Aulacodus. TEMMINCK, Monogr. de Mammalogie, i. p. 245.

Echimyina with but four toes to the hind feet; tail short: incisor teeth very broad, those of the upper jaw with three longitudinal grooves, those of the lower, flat in front; molar teeth of the upper jaw with one internal fold, and two external folds of enamel: skull short and broad, and with the occipital crest much elevated; a vertical plate on the upper part of the anterior root of the zygomatic arch forming the outer boundary of a groove for the infra-orbital opening.

The genus Aulacodus presents all the essential characters of the Echimys group, and therefore furnishes a remarkable exception in the geographical distribution of that section, which, with this exception, and a second furnished by the *Petromys typicus*, is strictly confined to South America. The dentition of Aulacodus can scarcely be said to differ from that of the genus *Carterodon*, excepting in the structure of the incisors, and of the foremost molar of the lower jaw; this latter tooth having three indenting folds on the inner side, whereas in *Carterodon* there are but two. The incisor teeth are still broader and stronger than in the last mentioned genus, and, indeed, they are relatively more powerful than in any other known Rodent: the upper incisors are strongly arched; broader than deep, flattened at the sides, and slightly convex in front, where they each present three deep longitudinal grooves; one of these grooves is placed very nearly

[1] From αὖλαξ, a furrow; and ὀδοὺς, a tooth.

in the mesial line of the tooth, and the other two grooves are disposed between this and the inner edge of the incisor, the innermost being separated from the edge only by a narrow ridge; the interspaces between the grooves are strongly convex in the transverse direction, and but little broader than the grooves; that which separates the first mentioned groove from the second is broadest. The molar teeth are very nearly equal in size, and the crowns of these teeth are nearly square. The enamel covering the molar teeth is unusually thick, and the indenting folds which it forms penetrate from either side to the mesial line of the tooth, or very nearly so.

Of the five toes to the fore feet, the outer toe on either side is very small; that which represents the thumb is the smallest, being a mere tubercle, with a short truncated nail; the nail of the outer toe is moderately large, and curved; the nails of the remaining three toes are large and strong, and fitted for burrowing; they are solid, longer than the toes, and but little arched above. To the hind foot are three well-developed toes, furnished with large and powerful nails, and a rudimentary outer toe provided with a moderate sized nail. The ears are short, but very broad; the tail short, being scarcely equal to half the body in length: it is rather sparingly clothed with stiff hairs.

But one species of this genus is known.

AULACODUS SWINDERIANUS.

The Aulacodus, or Ground Rat.

Plate 16, fig. 2.

Aulacodus Swinderianus. TEMM., Monogr. de Mamm. i. p. 248, Pl. 25.
" " BENNETT, Proc. of the Zool. Soc. for 1830-31, p. 111.

Body covered with stiff and bristly hairs on all parts: general hue brown, pencilled with black and yellow, or, sometimes, with dirty yellowish white; tail dusky above, whitish below.

Inhabits Sierra Leone, the neighbourhood of the Gambia, and South Africa.

The Aulacodus was first described by M. Temminck, from a very young specimen preserved in spirit of wine, and its native country and adult characters were not known to us until a specimen was procured at Sierra Leone by Mr. Boyle, who having presented it to the Zoological Society, enabled Mr. Bennett to publish a detailed account of its peculiarities in the Proceedings of that Society. A second specimen has since been received by the Society, and an adult specimen exists in the British Museum: the former was procured at the Gambia, and the latter is said to be from Port Natal, South Africa. At Sierra Leone the animal is known, according to Mr. Boyle, by the names *Ground-Pig* and Ground-Rat; and that gentleman states that it feeds upon ground nuts, cassada, and other roots. It burrows in the ground, and I have been informed that large holes formed by the Aulacodus are very numerous on some parts of the coast.

When full grown, the Aulacodus is but little short of two feet in length; it has a short head, a broad and obtuse muzzle, and small eyes: the ears project but little beyond

the coarse hairs of the head, but are very broad; the limbs short and stout; the toes short, and provided with large and solid nails; the tail short, and clothed with short stiff hairs, which do not completely hide the scaly skin. The covering of the animal consists entirely of stiff bristly hairs, which are flattened, and grooved along the upper surface; they are of moderate length, and closely applied to the skin; those on the upper parts of the animal are of a pale ashy grey colour at the root, dusky in the middle, and black at the point; most of them have a subterminal brownish yellow ring. The general hue of the animal is brown; less rich on the sides of the body than on the back, owing to the yellow rings on the hairs of these parts being paler, and the black pencilling less distinct. The chin and upper lip are whitish; the throat is of a dirty yellowish hue, and the abdomen of a very pale brownish yellow tint, pencilled with grey-brown. The feet are pencilled with black and yellow. The ears are moderately well clothed with hairs on the inner surface, but chiefly towards and at the margin, and these hairs are for the most part of a yellowish white colour, and about a quarter of an inch in length. The hairs of the moustaches are some of them white, but the greater portion are black, and there are some few long and coarse hairs mixed with those of the ordinary kind, springing from the upper surface of the muzzle. The hairs on the tail average about a quarter of an inch in length; those on the upper surface are chiefly black, but many of them are in part rufous, and those on the under surface are of a rusty white tint.

The above description is taken from the specimen before referred to, which was received from the Gambia: the specimen in the British Museum is a trifle less rich in the colouring of the upper parts of its body, and has a shorter tail, but in other respects agrees very closely. The admeasurements of these specimens are as follows:—

	Specimen from the Gambia.		Specimen from Port Natal.	
	Inches.	Lines.	Inches.	Lines.
Length from tip of nose to root of tail	20	0	21	6
" of tail	8	6	5	6
" of ear		6		6
Width of ditto	1	4	1	6
Length of fore foot and nails ...	1	8	1	10
" of the nail of the middle toe		7		7½
" of hind foot and nails ...	3	5	4	0
" of the nail of the middle toe		8		9
Width of incisor teeth		5¾		6

The specimen procured at Sierra Leone by Mr. Boyle is preserved in spirit of wine, and, according to Mr. Bennett, its length, measured in a straight line, from the nose to the root of the tail, is 17 inches; or, measured along the curve of the back, 20″; tail, 9″; head, 2½; fore leg, 3½; fore foot and toes, 1½; femur, 4½; tibia, 4½; tarsus and toes, 3½; ear, 1⅙ long, and 1″ broad.

The skull having been removed from this specimen, I have had an opportunity of comparing it with the crania of other Rodents, and the comparison has left no doubt on my mind as to the true affinities of the animal; it, in fact, *essentially* agrees with the skull of the Echimys, but at the same time presents certain peculiarities worthy of notice. It is short, and exhibits great strength in its parts. One of the most remarkable features of this skull is the great development of the occipital and lambdoidal crests; the former is raised so as to increase the height of the occiput by about a quarter of an inch; the lambdoid crest is rather less elevated, and springs chiefly from the large triangular interparietal bone. The frontal bones are separated by a groove, and a broad depression runs along the nasal bones, which, when viewed in front, present a double arch: these bones are of equal width at each extremity, and about one-third longer than broad. The lachrymal bone is of moderate size; the antorbital opening very large, and a second channel is formed (as in

Petromys, and the Octodons), for the infra-orbital nerve. The zygomatic arch is remarkably strong, having relation to the large size of the incisors, as has likewise the strongly developed crests on the hinder portion of the skull—the masticating muscles being attached to these parts. The malar bone is very deep in front, has a slightly raised post-orbital process, and an angular projection on the under side. The portion of the palate which lies between the molar teeth is slightly contracted, and has the sides parallel; it descends far below the level of the anterior half of the palate; in this latter are two large incisive *foramina*. The *palatine bones* run forwards to terminate opposite the second molar tooth, where there are two approximated palatal foramina opening forwards. The auditory bullæ are of moderate size. The occipital opening is nearly square, but presents a small notch in the upper margin. A very small portion of the mastoid bone is visible on the occipital surface of the cranium, which latter is remarkably flat, and nearly vertical.

	Inches.	Lines.
Total length of skull	3	6
Width of ditto	2	5
" between orbits	1	4½
" of the occiput	1	7
Height of the occiput	1	3
Length of nasal bones	1	2
Width of ditto behind		8
" in front		7¼
Length of zygomatic arch	1	8
Greatest depth of zygoma (which is beneath the anterior angle of the eye)		7½
Height of ant-orbital opening		8¼
Width of ditto		6
From incisor to molar teeth		10
Width of incisors		6
Length of four upper molars taken together		9
Width of palate between them		3¾
Length of incisive openings		6
Width of the two openings taken together ...		3½
Length of lower jaw	2	11
Height of ditto, from the condyle	1	3¼
Length of angular portion	1	5

SUB-FAMILY, DASYPROCTINA.

Dasyproctina (part). GRAY, Annals of Philosophy, vol. x. (New Series), p. 341 (1825); List of the Mammalia in the British Museum (1843), p. 124.

Hystricidæ with semi-rooted molars arranged in parallel series; the cranium elongated; nasal bones rather short and broad; malar bone destitute of a descending process on the lower edge; a tolerably distinct post-orbital process, formed chiefly by the frontal bone, but in part likewise by the squamosal; scapula with the emargination in the fore part of the spine but moderately deep; clavicles wanting; feet formed for running, with the toes 5—3, or 5—5, terminated by sub-solid nails, which are but little arched; tail rudimentary; body clothed with hair only—no admixture of spines.

Habitat, South America—ranging from the northernmost parts, southwards to Paraguay and Bolivia: occur, likewise, in some of the West India Islands.

Excepting in those characters which are common to the *Hystricidæ*, the Rodents of the present section differ very widely from the Cavies with which they have always been associated, and the differences, for the most part, indicate that the Dasyproctina are higher in the scale of organization than the Caviina. I allude more especially to those modifications which are exhibited in that most characteristic part of the animal, the skull. We now find a tolerably broad and perfect palate, which is neither contracted nor suddenly raised between the anterior molars, as in nearly all the species of the preceding sections, nor broken up by large incisive openings, as in the lowest of them: here the small incisive openings are confined to the intermaxillary bones. With this more perfect condition of the palate, may be noticed a corresponding change in the condition of the

sphenoid. Hitherto the openings in the sphenoid alæ have, from their large size, reduced the interspaces into mere narrow branches, but in the Dasyproctina the foramina in question are relatively small, and widely separated: the process corresponding to the external pterygoids is but little extended in the longitudinal direction, and the canal which runs forwards, between the pterygoids into the orbit, is very short. The internal pterygoid is proportionately large, being much more extended in the antero-posterior direction than in the preceding sub-families. The lachrymal bone is large, and perforated by the lachrymal canal[1].

Genus, *Cœlogenys*[2].

Cœlogenus. F. CUVIER, Annales du Muséum, x. p. 203 (1807).
Cœlogenys. ILLIGER, Prodromus Systematis Mammalium, &c., p. 92 (1811).
Osteopera. HARLAN, Fauna Americana, p. 126 (1825).
Cavia. LINN., Erxl., &c.

Dasyproctina with the zygomatic arch enormously developed, and of great depth; the portion which is due to the superior maxillary bone, presenting a large hollow beneath; the malar bone deeper than long; a separate groove for the infra-orbital nerve; cheek-pouches within the cavity formed by the zygomatic arch; molar teeth rather longer than broad, the crown of each of these teeth presenting four or five deeply indenting folds of enamel; incisors slender; toes 5—5.

The genus Cœlogenys contains but one well-established species — the Paca. This animal is arranged by mammalogists with the Agoutis, and, notwithstanding that it

[1] In the two preceding sub-families, *Echimyina* and *Octodontina*, the lachrymal bone is remarkably small, and in several of the species in these sections it only in part encloses the lachrymal canal.

[2] From κοῖλος, hollow; and γένυς, cheek.

differs widely from those Rodents in some respects, I am inclined to follow the usual course, regarding the differences in question as of minor importance. The enormous development of the zygoma in the Paca would appear to be a purely adaptive peculiarity, and hence cannot be regarded as indicative of a distinctness of type. To the Agoutis the Paca approaches most nearly in the general structure of the skeleton of the trunk; and even in the skull there is much resemblance, if we do not consider the zygomatic arches. It has the same elongated form, and the length is due in great part to the great longitudinal extent of the frontal bones, for, as in the Agoutis, the nasal bones are relatively short and broad. The pterygoid canal is short, and the external pterygoid is perforated in the antero-posterior direction, as in the animals just mentioned.

The molar teeth in the Paca are relatively larger than in the true Agoutis, and they differ moreover in being longer than broad; those of the lower jaw resemble the corresponding teeth in the Coypu (*Myopotamus*) in having one external, and three internal folds of enamel, but, viewing the outer surface of the lower molar in the Coypu, we find the two principal lobes of the tooth produced into more or less prominent angles, whereas, in the Paca, the same lobes are rounded externally. The foremost lower molar in the Paca, as in the Coypu, has an increase in the number of indentations of the enamel. In the immature animal (where but three molars are developed) this is more strikingly the case, for then the foremost molar has four internal folds of enamel, and I find a horse-shoe shaped area, surrounded by enamel, in front of them. This is most probably a milk tooth.

The upper molar teeth in the adult Paca have each two internal folds of enamel, and three transverse areas enclosed by enamel, with the exception of the hindermost tooth, in

which there are two external, and three internal enamel folds[1].

[1] If we regard a complicated Rodent's molar as normally having a primary external and internal indentation of enamel (marked *a* in the figures) dividing the body of the tooth into two equal, or nearly equal, parts, and as having two secondary indentations (marked *b* and *c*), each of which subdivides one of these two parts—the secondary folds, in the upper molars, entering from the outer side of the tooth, and, in the lower, entering from the inner side—then we may simply describe the lower molars of the Coypu and Paca as presenting the normal condition. The foremost upper molar of the Coypu is also normal, but the remaining upper molars depart from the type in having the hindermost of the secondary lobes internal instead of external. The upper molars of the Paca depart from the type in the same manner, and differ, moreover, in having an extra indentation on the hinder part of the tooth; and, in the hindermost molar, two extra enamel folds are visible, the additional lobes which they separate being joined to the back of the tooth, as we shall find also to be the case in the teeth of other mammals, in which the grinders are highly complicated.

Further, I have to remark, with respect to the enamel folds in the teeth of the Paca, that the principal internal indentation of the upper molars is often confluent with the foremost of the secondary folds, and that most of these latter, in the adult animal, become isolated from the enamel which surrounds the body of the tooth; the grooves, which separate the enamel plates, being deeper in the inner part of the tooth than near its margin.

CŒLOGENYS PACA.

The Paca.

Mus Paca.	LINN., Syst. Nat. 12, i. p. 81.
Cavia Paca.	SCHREB., Säugth. iv. p. 609, Pl. 171.
Cœlogenys Paca.	RENGGER, Säugth. von Paraguay, p. 251.
" "	WAGNER, Screb. Säugth. Suppl. iv. p. 52.
" *fulvus.*	F. CUVIER, Ann. du Mus. x. p. 207; skull, Pl. 9, figs. 1 and 2.
" "	PR. MAXIM., Beiträge, ii. p. 454.
" *subniger.*	F. CUV., Ann. du Mus. x. p. 206; skull, Pl. 9, figs. 3 and 4.
Osteopera platycephala.	HARLAN, Fauna Americana, p. 126.
Paca.	MARCGR., Bras. p. 224.
"	BUFFON, Hist. Nat. x. p. 269, Pl. 43; Suppl. iii. p. 203, Pl. 35.
Le Pay.	AZARA, Essais sur l'Hist. Nat. de Paraguay, ii. p. 20.
Spotted Cavy.	PENNANT, Synopsis of Quadr. p. 244.

Hair rather short, coarse, and by no means dense; limbs and upper parts of the body of a brown colour, varying in shade; under parts white; flanks with three, four, or five longitudinal white bands, which are more or less interrupted and broken up into spots.

Inhabits South America, extending from Cayenne southwards to Paraguay; and found likewise in Peru, but rarely; and in some of the West India islands.

The Paca is a stout-bodied animal about two feet in length; the limbs rather short; the head large, broad, and terminating in an obtuse muzzle, which is clothed throughout with fine hairs; the eyes, which are placed somewhat nearer to the ears than to the end of the muzzle, are large, directed obliquely upwards, and have a round pupil. The ears are rather below the medium size, and sparingly clothed with hairs. The feet are naked beneath, and provided with five

toes, but the inner toe, both of the fore and hind feet, is very small, and furnished with a correspondingly small nail; the nails of the other toes are rather broad, but little arched and nearly solid; they are moderately long. The tail, which is a mere fleshy tubercle, is naked. The fur of the animal is composed of one kind of hair only; the hairs are coarse, and closely applied to the skin.

In some specimens of the Paca but three white bands are visible on the sides of the body, a few white spots, above these, being all that remain in such specimens of a fourth band, which in other individuals is distinct; sometimes there are five lateral bands. The female Paca has two pairs of teats, one pair being pectoral, and the other inguinal.

Not only does our animal vary in the number of bands on the flanks, but likewise in the general tint of the upper parts of the body and of the limbs; and M. F. Cuvier, perceiving that differences of colouring in certain individuals were accompanied by peculiarities in the cranium, concluded that there existed more than one species of Paca; and, in fact, that two kinds might be distinguished—the one by a blackish umber colour, and by the outer suface of its skull being smooth; and the other by the general hue of the body being fawn-coloured, and the skull having the surface rough. To the first he gave the specific name *subniger*, and to the second that of *fulvus*.

The following description is from a specimen in the British Museum, which corresponds with M. Cuvier's

Cœlogenys subniger.

The prevailing hue is black-brown; the whole of the under parts are white, faintly tinted with yellow, as well as the inner surface of the limbs. The cheeks are whitish; the hairs of the moustaches are most of them white, but some few are blackish. Three narrow, longitudinal, white bands adorn

each side of the body; the uppermost of these, which is the shortest, commences behind the shoulder, and terminates on the haunches; the remaining two extend both over the shoulders and haunches. All these bands are interrupted in parts, and they are more completely broken up into spots at their extremities.

	Inches.	Lines.
Length from tip of nose to root of tail ...	23	0
" from ditto to ear	4	0
" of ear		10
Width of ditto	1	1
Length of fore foot and nails	3	11
" of nail of middle toe		$5\frac{1}{4}$
" of hind foot and nails	3	11
" of the nail of the middle toe		8

This specimen is from Granada—St. Fé de Bogota; its skull shows it to be an immature animal, since there are but three molar teeth developed on each side of the jaw: the outer surface of the zygoma, and of the frontal bones, is very nearly smooth, there being a very slight roughness on the fore part of the zygomatic process of the superior maxillary bone. I possess a cranium from the Province of Minas Geraes precisely corresponding with this.

Cœlogenys fulvus. F. Cuvier.

An animal agreeing with M. Cuvier's description of *C. fulvus* also forms part of the British Museum collection. It is rather less than the dark Paca just described (being perhaps younger), and differs in being of a bright rufous-brown colour on the whole upper parts of the body, as well as on the flanks and external surface of the limbs, if we except the white bands and spots on the latter parts. The under parts are white—not quite pure. On the sides of the body are three longitudinal, interrupted, white bands, and these extend on

to the haunches, on which part are two rows of spots, one above, and the other below the three principal bands. Its skull cannot be examined. This specimen is said to be from tropical America.

That the different shades of colouring observed in the Paca do not indicate a distinction of species, is now satisfactorily proved by the observations made upon these animals by Dr. Lund in Brazil, and by those of Dr. Rengger, who studied them in Paraguay. Both these authors agree in stating that the Paca is subject to considerable variety of tint, and the former observes that specimens occur presenting all the intermediate shades between the dark and light varieties; whilst the latter author states that he has met with Pacas of different shades of colour, and these paired, and living in the same burrows[1].

The skull of the Paca, as I have before stated, if viewed without the zygomata, is of the same elongated form as that of the Agoutis, but the enormous size of the zygomatic arches, and these being thrown boldly outwards—most so at their hinder extremity—gives to the whole structure a width which only falls short of the length by about one-fourth part. The upper surface of the cranium is very little arched in the longitudinal direction, but a transverse section would be nearly semicircular. The frontal bones are very long; the

[1] According to Dr. Rengger, however, the usual tint of the Pacas in Paraguay is bright yellow-brown on the upper parts and sides of the body; the extremities dark yellow-brown; the rows of spots, or interrupted stripes, on the sides of the body (of which there are said to be five), and the under parts yellow-white. The dimensions of a very large female Paca, Dr. Rengger found to be as follows:—

	Inches.	Lines.
Head and body	25	6
Tail		4
Medium height	13	0
Length of skull	5	0
Breadth of ditto	3	3

nasal bones short and broad. The infra-orbital opening is proportionately smaller than in most other *Hystricidæ*, the space being contracted by the unusual development of the zygomatic portion of the superior maxillary, in which a long, narrow channel, opening above in the infra-orbital outlet, marks the course of the infra-orbital nerve. The zygomatic arch, in a skull in which but three molar teeth are developed on either side of the jaw, measures in the longitudinal direction about half the entire length of the cranium, and its depth is equal to half its length; but, in the adult animal, the length and depth are proportionately greater, the former being sometimes equal to two-thirds of the entire length of the skull. The hinder third of the arch (or rather less in the young animal), is formed by the malar bone, which has the greatest vertical diameter, and the remaining portion (which gradually decreases in width towards the fore part) is formed by the superior maxillary bone. This latter portion encloses a large oblong cavity beneath, which, in the living animal, is lined, as it were, by a continuation of the skin of the face, and beneath this is a pouch formed of the skin of the cheek: the pouch has a small outlet, which opens in front of the molar teeth. The uses of this pouch have not yet been determined. Two strongly elevated ridges, separated by a deep groove, run along the fore part of the palate, from the molar teeth almost to the incisors; the portion of the palate which lies between the molars is slightly contracted in front, and deeply emarginated behind. The squamous portion of the temporal bone extends backwards to the occipital plane.

Besides these leading peculiarities in the singular cranium under consideration, we have to notice the extreme roughness of the zygoma, and of the frontal bones, which is observable in the skulls of some Pacas. In such, the whole outer surface of the parts in question is studded with small wart-like excrescences, more or less confluent, and in some parts

(especially on the malar bone) joining so as to form coarse and very irregular wrinkles[1].

[1] This roughness of the surface increases with age, as is clearly seen by the different conditions presented by a series of crania in the British Museum. In these crania the frontal bones and zygomatic arches are more rough in proportion as the molar teeth are more worn. But though this roughness occurs in some Pacas' skulls, there are others which remain smooth, even in the adult animal; and this fact leads us to take into consideration the views of M. F. Cuvier, which have already been alluded to—viz. that the rough and smooth crania belonged to different species of Paca — species distinguished not only, it is said, by the peculiarities just referred to, but by colour, and by a difference in the degree to which the zygomata are extended in the lateral direction. The difference of colour, it has already been shown, cannot be regarded as specific, and a comparison of the following dimensions will demonstate that the lateral expansion of the zygomata in the smooth skull is not always less than in the rough skull, as has been stated.

	Very old. Rough.		Adult. Rough.		Adult. Rough.		Adult. Zygoma rough; frontal bones smooth.		Adult. Smooth.		Young, with three molars. Smooth.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines
Total length of skull ...	5	7	5	1	5	6	6	0	5	2	4	7
Greatest breadth ...	3	8	3	3	3	5	4	1	3	3	2	9½
Width between orbits .	1	7½	1	5	1	7	1	11	1	7	1	3
Length of nasal bones .	1	8	1	7	1	9	2	1	1	8	1	4
Width of ditto in front		10		9		11	1	0¾		10		7¾
Length of zygoma ...	3	6	2	10	3	2	3	6¼	2	10	2	7
Depth of a malar bone	2	1	1	7	1	9	2	0	1	7½	1	2
Of zygoma, in a vertical line, dropped from the anterior angle of orbit	1	7	1	3¼	1	6	1	8	1	4½	1	2¼

Not having been able, then, to discover any points of distinction in the skulls of the Paca, excepting that noticed in the condition of the surface of certain bones, I am induced to regard this distinction (when it presents itself in adult skulls) as a sexual one. This view has been suggested by Dr. Lund, and, as Dr. Wagner truly observes, requires confirmation.

Analogical considerations would lead us to suppose that the rugose cranium distinguished the male Paca; and, connected with this view, I must notice a

With respect to the habits of the Paca, we have only to observe, that it is generally seen, singly or in pairs, on the borders of the forests, or near the banks of rivers, but only after sunset, since during the day it lies concealed in some cavity beneath the root of a tree, or in a burrow of its own excavation; its burrow usually being about four or five feet in depth. Its food, Dr. Rengger states, consists of the leaves of different plants, and of fruits and flowers. Occasionally it visits the plantations of sugar-cane and melons, and does considerable mischief. The female has but one young at a birth, and this is said to follow the parent for two or three months. The range of the Paca is very extended, the animal being found nearly throughout South America, from its northernmost parts down to Paraguay. In Brazil it is tolerably plentiful; in Peru it is rare; and in Paraguay it is by no means common. It occurs in Bolivia, in the department of Sierra de la Cruz. The Paca is likewise found in Tobago and Trinidad. On the west side of the Andes it does not occur.

The accompanying woodcut represents the dark variety of the Paca, and a specimen in which the lateral lines are more broken up into spots than is usual.

peculiarity which is striking in the five adult rough skulls which lie before me. Not only are the more aged skulls more rugose than the others, but there is a considerable amount of variation in the pattern (if I may so term it), which the warty excrescences and rugæ assume. Parts which are rough in a cranium in which the molars are moderately worn, are smooth in a second cranium having indications of greater age in the condition of the teeth, whilst in this second skull other parts are more distinctly rugose. Can it be that this deposition of bony matter is periodical, and that it bears some analogy to the periodic deposition of bony matter which forms the horns of the male deer?

Cœlogenys laticeps (Fossil).

Cœlogenys laticeps. Lund, Det Kongel. Danske Vidensk. Selsk. Naturvidensk. og Mathem. Afhandl. viii. Pl. 20, fig. 1.

Founded upon a fossil cranium (from the caverns of Brazil), having the surface of the frontal bone and zygomatic arch smooth; and which differs, according to Dr. Lund, from the skull of the *Cœl. Paca* in the infra-orbital opening being larger, the upper part of the bony ring, which encloses it, narrower, and the zygoma thrown more boldly outwards[1].

Dr. Lund distinguishes a second fossil species of *Cœlogenys* from the same caverns, to which he gives the name

[1] Differences of the same kind, and almost equal in degree (judging from Dr. Lund's figures), are presented in the crania of the recent species of Paca.

Cœl. major. It appears to be chiefly separated from the recent species on account of its superior size.

From the caverns above alluded to, the British Museum contains numerous remains referrible to the genus Cœlogenys. The most characteristic specimen among these, is a considerable portion of a skull, in which I can find no points which would lead me to suppose it belonged to a species distinct from the Common Paca.

Genus, *Dasyprocta.*

Dasyprocta.	**Illiger**, Prodrom. Syst. Mamm. &c. p. 93 (1811).
Platypyga.	**Illiger**, l. c.
Chloromys.	F. Cuvier, Ann. du Mus. xix. p. (1812).
"	Lesson, Manuel de Mamm. p. 300 (1827).
Cavia.	Erxl., Schreb., Gmel.
Mus.	Linn., Syst. Nat.

Dasyproctina with but three toes to the hind feet; the limbs long and slender; crowns of the molar teeth of a rounded form, with a single indenting fold of enamel, and four or five transverse, isolated grooves surrounded by enamel: the hairs covering the hinder parts of the back coarse, and very long.

Inhabits some of the West India Islands, and nearly all parts of South America (east of the Andes), down to Paraguay.

To this genus belong the Rodents commonly known by the name Agoutis; animals which, being common in many parts of South America, are easily captured, and, feeding upon almost any vegetable substance, are frequently brought to Europe to enrich our menageries. Most of the species are equal to the Common Hare in size, and they may all be distinguished by their slender and graceful form, combined with a very small, or rudimentary tail; an elongated head terminating in a broad and obtuse muzzle; moderate sized ears, which are of

somewhat rounded form, but truncated, or slightly emarginated on the hinder part; large and moderately prominent eyes; five toes to the fore feet, of which the innermost is a mere tubercle, though supporting a nail; and three toes to the hind feet, which are long, and, like the fore feet, entirely naked beneath. The nails of the toes are but little arched, and nearly equal in depth and width, and by no means sharply pointed. This form of nail is found in burrowing and in running animals[1], but in the former it is combined with short and powerful limbs, a condition in these parts very unlike that presented by the Agoutis. These animals, then, we should infer, from their general structure, are fitted for running; and that they neither climb nor burrow, but are very swift runners, we are informed by those who have observed their habits in their native country. Though, however, the Agoutis do not burrow, they will scratch holes to obtain the roots of certain plants which are palatable to them.

The fur of the Agoutis consists of coarse hairs, which are for the most part of moderate length, but on the hinder third of the back are remarkably long—a peculiarity which suggested their generic name. The dentition in these animals more nearly resembles that of the true Porcupines than any other Rodents; the molar teeth being semi-rooted, their crowns of a rounded form, and the enamel folds being most of them isolated when the tooth is but little worn. The enamel which breaks up the surface of the tooth, here, is not continuous with that which surrounds the tooth, but merely encloses small grooves, which for the most part are arranged transversely. Of such grooves four or five are seen in each molar. One fold or loop of enamel, however, is seen in each tooth; it is that which is most constant in the molars

[1] In climbing Rodents, such as the Squirrels, the toes are provided with very deep and compressed nails, and these much curved, and sharply pointed.

of the Rodents, namely, the middle inner fold in the upper molar, or the principal outer fold in the lower molar. Not only in the structure do the molars of the Agoutis nearly resemble those of the true Porcupine, but these two sections of the Hystricidæ agree in having the molars of opposite sides of the jaw arranged in parallel series. The incisor teeth are somewhat slender, rather deeper than broad, and their anterior surface is convex.

Upon comparing the skeleton of the Agouti with the same part in any of the *Echimyina*, the most important differences are those which present themselves in the cranium: some of these have already been noticed, and with reference to this part of the structure, I will only further add, that the zygomatic arch is short, and the malar bone is proportionately slender, but suddenly deepens near its anterior extremity, where it sends out a post-orbital process: in a perpendicular line, above the point of this process, lies the centre of the orbit, which is bounded anteriorly in a great measure by the lachrymal bone, but partly likewise by the frontal, the maxillary, and the malar bones. Of the hinder division of the eye-cavity, the upper half only is enclosed by bone: the supra-orbital ridge is very prominent. The depression above the hinder root of the zygoma, which marks the course of the temporal muscle, is very contracted[1]. The squamosal or squamous element of the temporal, here does not extend to the plane of the occiput, as in the Paca's skull, the petro-mastoid intervening. There is scarcely any trace of the descending, lateral process of the supra-occipital bone, which is so characteristic of the skulls of the *Echimyina* and Octodons. A large opening in the superior maxillary is seen immediately above the anterior root of the zygoma,

[1] A side view of the cranium of an Agouti, showing the disposition of the masticating muscles, will be found on Pl. 6 *a*, fig. 1; the lettering of the figures is explained at p. 151.

which communicates posteriorly with the lachrymal canal, and, anteriorly, with the nasal cavity[1].

In the remaining parts of the skeleton there are but few points to arrest our attention. A skeleton of the Common Agouti in the British Museum, has 13 dorsal, 6 lumbar, 5 sacral, and 10 caudal vertebræ. The spines of the cervical vertebræ are very little elevated, if we except the vertebra dentata, which has the spine considerably elongated, and much extended in the antero-posterior direction. The spine of the foremost dorsal vertebra is short, but the second, and several following dorsal vertebræ, have the spine elongated. The scapula resembles that of the Hare in having a branch thrown out laterally from the anterior termination of the spine, but differs in having the supra-spinal fossa much larger: here the portion of the scapula which lies above the spine is strongly dilated in the middle[2]. The humerus has

[1] An opening, corresponding to this, is found in many rodent skulls, but being very conspicuous in the cranium of the Agouti, I here notice it. It is large in the skull of the Guinea-Pig, and of moderate size in that of the Chinchilla, where a very narrow strip of bone separates it from the lachrymal opening; immediately below the last-mentioned opening is seen a slender branch (being a portion of the superior maxillary) which runs upwards and backwards to join the frontal, and forms a partition between the orbital outlet of the spheno-palatinal canal (which is very large) and the opening connected with the lachrymal canal, before alluded to. The same remarks will apply to the skull of the Habrocoma, but here the small lachrymal bone does not enclose the lachrymal canal. In the Octodons, and the Echimys group, the opening into the lachrymal canal is either very small, or entirely wanting; it is wanting in the Coypu, and either can scarcely be traced, or is absent, in the skulls of Nelomys and Echimys: in these sections, moreover, the spheno-palatine opening is very small, and the small lachrymal bone rather leads to, than forms part of, the lachrymal canal.

[2] Such is also the case in the Coypu, Capromys, and Echimys, but in these animals the supra-spinal fossa is relatively smaller than in the Agoutis; and, whilst the outline of the upper, or cervical margin, of the scapula is rounded in the *Dasyproctina*, it generally forms a more or less distinct angle in the *Echimyina*. The lower margin forms a slight sigmoid curve in the *Dasyproctina*, and is straight in the animals belonging to the two preceding sub-families.

the deltoid crest but moderately raised, and in this respect differs from the humerus in the species of the two preceding sections[1]. In the structure of the wrist, the Agouti and Paca present this difference, that, while the former has a small supernumerary bone (commonly found in the Rodents[2]) wedged in between the trapezoides and os magnum, the latter wants this bone. All the five toes of the fore foot are perfect, but the bones of the inner toe are small and slender, and notwithstanding that the clavicles exist only in a rudimentary condition in the Agouti, the fore feet are used by the animal to hold its food and convey it to the mouth. In the hind foot of the Agouti not only are the phalanges of the outer and inner toes wanting, but the metatarsal bones of these toes are likewise absent.

DASYPROCTA AGUTI.

The Yellow-rumped Aguti.

Mus Aguti. LINN., Syst. Nat. 12, i. p. 81.
Cavia " SCHREB., Säugth. iv. p. 613, Pl. 172 A.
Dasyprocta Acuti. DESM., Mamm. Part 2, p. 357.
" *Aguti.* WAGLER, in Isis, 1831, p. 618.
" " (Long-nosed Agouti). BENNETT, Gardens and Menagerie of the Zool. Soc. i. p. 293.
" " PR. MAXIM., Beiträge, p. 458.
" " WAGNER, Schreb. Säugth. Suppl. iv. p. 42.
" " F. CUVIER et GEOFF., Mamm. 1re livr.

[1] The deltoid crest is marked * on the bone *h* of Plate 16, fig. 1 : in the *Echimyina* and *Octodontina* it is less prolonged in the direction of the shaft of the humerus, but is produced into a more or less distinct process—a process which is much developed in the Ctenomys and Coypu.

[2] Here the supernumerary bone in question articulates with the metatarsal of the second toe, and its position so far differs from that of the extra bone marked * in figure 2 of Plate 14. In the foot of the Hare the second metatarsal also articulates with the supernumerary bone, but to do so, the metatarsal runs up between the os magnum and os trapezoides, whilst in the Agouti the small extra wrist-bone descends to the level of the lower edge of the os trapezoides.

Agouti.	BUFF., Hist. Nat. viii. p. 375, Pl. 50.
"	SHAW, General Zoology, ii. Part 1, p. 24, Pl. 126.
Long-nosed Cavy.	PENNANT, Synopsis of Quadr. p. 245.

General tint olive-brown (the fur distinctly pencilled with black and yellow); mesial line of abdomen yellow or whitish; the long hairs covering the hinder portion of the back for the most part of a bright orange colour.

Inhabits Guayana, and the northern portions of Brazil.

The Yellow-rumped, or Common Agouti, though abundant in most of the northern portions of South America, does not occur, according to the observations of Dr. Natterer, in the southern parts of Brazil. It is subject to some slight variation in its colouring, arising from the yellow portions of the hairs of its fur being more or less rich—sometimes pale, and sometimes with a considerable admixture of red, but it may be distinguished by the long hairs which cover the hinder part of the back being chiefly of a rich yellow, or sometimes yellow-red hue. These hairs are most of them four inches, or more, in length; white, or nearly so, at the root, and sometimes entirely yellow beyond that part, but usually they present four or five narrow black rings. On other parts of the body the somewhat coarse hairs of the fur are of moderate length; black, and commonly with two yellow rings: on the abdomen the black is replaced by dusky, and the yellow is less rich; and along the mesial line the hairs are often entirely yellow, and sometimes white. The feet are pencilled with black and yellow, and the toes are dusky. In some specimens, which do not otherwise differ from this description, the feet are entirely black. The ears are large, and of a pink colour, excepting at the margins, where they are dusky. The chin is whitish, and the hairs of the moustaches black. The small fleshy tail is naked, and of a dusky hue.

	Zoological Society. Inches.	Lines.	British Museum. Inches.	Lines.
Length from tip of nose to root of tail	20	0	18	6
" from ditto to ear	3	6	3	7
" of ear	1	0	1	0
Width of ditto	1	4	1	4½
Length of fore foot, not including the nails	1	4		
" of the nail of the middle toe ...		4½		
" of the hind foot, without the nails	3	10	3	10½
" of the nail of the middle toe ...		7		5½
" of tail, about		7		8
" of skull			3	11
Width of ditto			1	11¾
" between orbits			1	2
Length of nasal bones			1	4
Width of ditto in front				7¼
" " behind				8
Length of frontal bones			1	7½
From incisor to molar teeth			1	0
Length of four upper molar teeth, taken together				8
Width of palate between foremost molars				4½
Length of lower jaw			2	3½
Height of ditto, measuring from the condyle			1	0
Length of angular portion			1	1

DASYPROCTA CROCONOTA.

White-toothed Agouti.

Dasyprocta croconota. WAGLER, in Isis, 1831, p. 618.
" " SCHREB., Säugth. Pl. 172 B.
" " WAGNER, Schreb. Säugth. Suppl. iv. p. 44.

Incisor teeth white: general hue of the fur, rich olive-brown; the greater portion of the back, as well as the rump and upper part of the thighs, of a bright yellow-red colour; mesial line of abdomen white; nails of toes short.

Inhabits Brazil.

The *D. croconota* is founded, by Wagler, upon an Agouti brought from the Amazon River by Spix; it is said to agree very nearly in size with the Common Agouti, but to differ from that and other species of the genus, by its incisor teeth being entirely white, the fore part of these teeth being usually of an orange colour in the Agoutis It differs, moreover, from the Common Agouti, according to the description of Wagler, in having the tarsi shorter, and the nails shorter and more compressed, as well as in the general hue of its fur being much richer. The head, neck, and fore part of the back, are pencilled with black and orange, and the sides of the body with black and yellow: the whole hinder half of the back, as well as the rump and upper part of the thighs, are of an uniform bright yellowish red colour: the hairs on these parts are, however, yellow at the roots; the mesial line of the abdomen is white, and the white is continued forwards to the chest; the ears flesh colour, broadly margined with dusky; the feet dusky brown.

The following dimensions, furnished by Dr. Wagler, indicate the differences of proportions which this species presents when compared with the Common Agouti.

	D. croconota.		*D. Aguti.*	
	Inches.	Lines.	Inches.	Lines.
Length from tip of nose to root of tail ...	17	9	18	0
" of head	3	11	3	7
" of tarsus (not including the nails)	3	5	3	10

DASYPROCTA PRYMNOLOPHA.

Dasyprocta prymnolopha. WAGLER, in Isis, 1831, p. 619; Schreb. Säugth. Tab. 172 c.
" " WAGNER, Schreb. Säugth. Suppl. iv. p. 46.

Fur pencilled with black and rich yellow; loins and sides of the rump golden yellow, more or less inclining to rufous; a tuft of long black hairs on the back of the head, and a broad black band extending from the middle of the back to the tail; abdomen golden yellow, with a mesial white line.

Inhabits Guayana.

Although I have seen several specimens of an Agouti agreeing with Dr. Wagler's *D. prymnolopha*, I am not aware from what part of South America they were procured. The specimen described by the author just mentioned is said to be from Guayana.

This is certainly one of the most beautifully coloured species among the Agoutis, and is readily distinguished by the broad black band which runs along the hinder half of the back, and is continued to the tail. This band is rendered the more conspicuous by the parts immediately adjoining it, on either side, being of a rich golden yellow, or sometimes of a bright yellow-rust, or yellowish chestnut colour. The hairs covering the hinder part of the back are very long, and the exposed end only of each of these hairs is black; at the root they are yellow. Another peculiarity which this species presents is the large tuft of black hairs on the hinder part of the head. The chin, angle of the mouth, and lower jaw, are white; the fore part of the neck, and the upper part of the chest, are pencilled with dusky and yellow, and the lower or hinder part of the chest, and the abdomen, are golden yellow, excepting in the mesial line, where the hairs are

white. The ears are large, and of a pink colour, with the margin dusky.

	Inches.	Lines.	Inches.	Lines.
Length from nose to root of tail ...	19	6	18	9
" from nose to ear	3	6	3	8
" of tail, about				8
" of ear	1	0	1	0
Width of ditto	1	4	1	5
Length of hind foot, not including nails	3	9	3	8
" of nail of middle toe		6		6

The feet are black in the specimen from which the foregoing description is taken, which is in the museum of the Zoological Society, but in that described by Dr. Wagler they are freckled with black and yellow, as is also the case in one of two specimens in the British Museum. The second specimen in the National Collection differs from others which have come under my notice, in having very little black pencilling, excepting on the back of the neck and shoulders; its prevailing hue being bright golden yellow; the upper parts orange yellow, freckled with black; the tuft on the back of the head, as well as the broad band on the hinder half of the back, are, as in other specimens, perfectly black; the feet are golden yellow, slightly freckled with black, and the toes are black. The dimensions of this specimen will be found in the second column; those of its skull are as follows:—

	Inches.	Lines.
Length of skull	3	10½
Width of ditto	1	10
" between orbits	1	2
Length of nasal bones	1	3⅔
Width of ditto in front		6⅓
" " behind		7
Length of frontal bones	1	6¾
From incisor to molar teeth		11½
Length of four upper molars, taken together		8⅓
Width of palate between foremost molars ...		3½
Length of lower jaw	2	3
Height of ditto, measuring from the condyle	1	0
Length of angular portion	1	0

The cranium from which the above dimensions are taken differs from that of the *D. Aguti*, in being narrower and longer, in having the muzzle more attenuated, the palate narrower, and in the form of the malar bone. This bone in the *D. prymnolopha* throws up a distinct post-orbital process, the point of which is removed from the malo-maxillary suture by a distance of about one line, whilst in the *D. Aguti*, where the post-orbital process is less produced, and forms an obtuse angle, the apex of that angle is divided by the malo maxillary suture; one half, then, of the post-orbital process is here formed by the zygomatic process of the superior maxillary. The lower margin of the angular portion of the lower jaw is much less thickened in the *D. prymnolopha*, and presents no trace of an angular process on the inner edge, whilst such a process is distinct in the lower jaw of the *D. Aguti*.

DASYPROCTA CRISTATA.

Crested Agouti.

Cavia cristata.	(GEOFF.) DESM., Nouv. Dict. d'Hist, Nat. i. p. 213.
Dasyprocta cristata.	DESM., Mammal. Pt. 2, p. 358.
" *variegata.*	TSCHUDI, Fauna Peruana, Pt. 5, p. 190 (1845).
Agouti à crête.	F. CUVIER et GEOFF., Mammif. livr. 52, tom. iii.

Fur long and harsh, pencilled with black and dirty brownish yellow, or rufous yellow, the black prevailing ; limbs dusky ; the long hairs on the hinder part of the back black, obscurely pencilled with rufous: a large tuft of long black hairs on the back of the head.

Inhabits Surinam (and Peru ?)

In the Museum of the Zoological Society are three specimens of Agouti, which, agreeing very closely with M. Desmarest's description of the *Dasyprocta cristata*. I shall proceed to notice under this head. Compared with other Agoutis (the

Dasyprocta fuliginosa excepted) they are distinguished by the general dark hue of the fur; and, from the *D. Aguti* they further differ in being larger, in having the muzzle more elongated, the ears relatively smaller, and in possessing a distinct tuft, or crest, of long black hairs, springing partly from the back of the head, and partly from the adjoining portion of the neck. In two of these specimens the fur is black, pencilled with brownish yellow, the black prevailing, especially on the back; the legs are almost entirely black, and the feet are black. A dusky patch is observable immediately behind the base of the fore leg; the throat is whitish, and the abdomen is yellowish along the mesial line, with a slight admixture of dusky. The long hairs covering the hinder part of the back are for the most part black, being but obscurely annulated with brownish yellow. In the third specimen the hairs of the fur are annulated with reddish chestnut instead of the brown-yellow[1].

The dimensions of one of these specimens is given in column No. 1; in columns 2 and 3, are the admeasurements of two specimens of *Dasyprocta* in the British Museum, which Mr. Gray regards as specifically identical with the *D. cristata*—an opinion in which I agree. These latter specimens, however, differ considerably in their colouring from the animal described by Desmarest, and perhaps form a permanent variety. Their peculiarities I will point out under the head—

Dasyprocta cristata, variety.

Fur pencilled with black and dirty pale yellow (on the abdomen with the black replaced by dusky brown); the hinder half of the back of a bright rust colour; a distinct crest on the back of the head.

[1] The female of this species, according to Desmarest, has six mammæ, whilst the *D. Aguti* is said to have twelve. In the *D. punctata* I found four pairs of teats; the foremost pair being pectoral, and the hindermost inguinal.

The black is less pure in these animals than in the Zoological Society's specimens, and has a slight brownish cast. In one specimen the crest on the back of the head is black, and the long hairs on the hinder part of the back are of an uniform bright rust colour; whilst in the other, the crest is dusky brown, and the long hairs of which it is formed are annulated with dirty yellow; the hairs on the hinder part of the back are rather obscurely annulated with black; the rust colour prevailing. These hairs, in both specimens, are of a palish golden yellow colour at the root. The abdomen can scarcely be said to differ in tint from the sides of the body, and in this respect differs from the same part in the *D. Aguti*; there is, however, a whitish line on the lower part, in the mesial line.

	No. 1.		No. 2.		No. 3.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length from tip of nose to root of tail ...	20	6	21	0	21	6
" from ditto to ear	4	0	4	2	4	4
" of ear		9		10		9
Width of ditto	1	3	1	4	1	4
Length of hind foot, without the nails ...	3	9	4	8½	4	8
" of nail of middle toe				7½		8
" of tail, about				6		6

Upon looking through Dr. Tschudi's description of the *Dasypr. variegata*, that animal appears to agree in all respects with the *D. cristata* of Desmarest; which thus, it would seem, extends into Peru.

DASYPROCTA FULIGINOSA.

The Sooty Agouti.

Dasyprocta fuliginosa. **WAGLER, in Isis for 1832, p. 1220.**
" *nigricans.* **(NATTERER) WAGNER, in Archiv für Naturgesch. 1842, Pt. 1, p. 362; Schreb. Säugth. Supp. iv. p. 46.**

Dasyprocta nigra. GRAY, Ann. and Mag. of Nat. Hist. vol. x. p. 264, Dec. 1842; Voy. of the Sulphur—Mammalia, Pt. 2, Pl. 16.

Fur sooty black, somewhat obscurely pencilled with white (or sometimes with pale yellow); feet black; ears tolerably well clothed with hairs.

Inhabits the northern provinces of Brazil.

Dr. Wagner has satisfied himself, by a comparison of the specimens, that the Agouti described by Wagler under the name *fuliginosa*, is the young of the *D. nigricans* of Natterer, and this latter is clearly the same as the *D. nigra* of Mr. Gray.

The various names given to this species all have allusion to its dark hue; and, if we add that it is larger than other species of Agoutis, and has the ears more perfectly clothed with hairs, we have noticed its leading characteristics.

The specimen in the British Museum, upon which Mr. Gray founded the *D. nigra*, is rather larger than the *D. cristata*. Its fur is of a sooty black hue, and somewhat obscurely pencilled with white. The white is most distinct on the flanks and under parts of the body, whilst it is almost wanting on the crown of the head, shoulders, and outer surface of the thighs. The hairs on the rump (which are four inches, and some of them more, in length) are white at the root, and indeed for the greater part, but their exposed ends are black: many of them, however, have the extreme point white, as well as the root. On the fore part of the back many of the hairs are perfectly black. The muzzle and chin are brownish; the hairs of the moustaches black; the throat dirty white; the fore legs are black in front and on the outer side, and dusky, with much white pencilling, on other parts; the feet are black. The ears, which are rather

large, are well clothed with hairs; those on the outer surface are dusky brown, and those on the inner side are yellowish (slightly pencilled with dusky), excepting at the margin, where the hairs are coloured like those on the outer surface.

The admeasurements of this animal (which is said to be from tropical America) are as follows:—

	Inches.	Lines.
Length from tip of nose to tail	23	0
" from nose to ear	4	4
" of ear	1	1
Width of ear	1	6
Length of tarsus, not including the nails ...	4	9
" of nail of middle toe	0	9
" of tail, about		10

Of two specimens brought home by Dr. Natterer, one is from Borba, and the other from Rio Negro. The specimen described by Wagler was procured by Spix on the Amazon.

One of Dr. Natterer's specimens, according to the detailed description furnished by Dr. Wagner, has the hairs of its fur ringed with pale yellow instead of white—the black prevailing on the hinder part of the back; they are at the root whitish, and this is followed by a broad blackish brown space; a narrow, sub-terminal, pale yellow ring is seen on each hair, and the point is black. In the second specimen the hairs are black, with a single pale ring near the point. The white being much extended on the long hairs covering the hinder part of the back, prevails over the black in this part; on other parts of the back the black prevails. On the back of the neck is a narrow black tuft.

DASYPROCTA AZARÆ.

Azara's Agouti.

Dasyprocta Azaræ. LICHT., Verzeichniss der Doubletten des Zoolog. 1823, p. 3.
WAGNER, Schreb. Säugth. Suppl. iv. p. 39.

Dasyprocta punctata.	Gray, Annals of Nat. Hist. vol. x. p. 264 (Dec. 1842); Zool. of the Voy. of the Sulphur—Mammalia, Pt. 2, p. 36, Pl. 15.
Chloromys Acuti.	Rengger, Naturgesch. der Säugth. von Paraguay, p. 259 (1830).
L'Acouti.	Azara, Essais sur l'Hist. Nat. des Quad. de Paraguay, ii. p. 26.

Fur on all parts distinctly pencilled with black and rich yellow, excepting on the abdomen, which is yellow, and often has a white mark running along the middle line.

Inhabits Paraguay, Bolivia, and the southern parts of Brazil.

Of this species I have examined many specimens, brought from Bolivia by Mr. Bridges, who informs me that these Agoutis inhabit the woods in the neighbourhood of Santa Cruz de la Sierra, and are known, in that part, by the name "Hoche colorado." Dr. Wagner states that Dr. Natterer found this animal in great numbers at Ypanema, in the Province of St. Paulo, Brazil, where it appears to take the place of the *D. Agouti*, which only occurs further north.

The specimens which have come under my notice varied but little in their colouring, and were almost equal in size to the *D. Agouti*, from which animal they differed in having the long hairs on the hinder part of the back as distinctly annulated with black and yellow as those on other parts of the back. The yellow was richer (inclining to rufous) in some specimens than others; and, in some, the bright yellow colour of the abdomen was not interrupted in the mesial line by the white mark which is usually seen in that part[1]. The feet are always darker than in other parts, having a greater admixture of black, which increases towards their extremities.

The animal described by Mr. Gray, under the name *D. punctata*, appears to me to be clearly identical in species with

[1] In one specimen there was but a small spot of white on the middle of the abdomen.

this Bolivian animal, differing only in having the feet black. Its fur is pencilled with black and yellow in about equal proportions; the yellow assuming a richer, and somewhat rufous tint, on the back. The throat and belly are yellow. The long hairs on the hinder part of the back have about five yellow, and the same number of black rings; the yellow assuming a paler hue towards the roots of the hairs. On the fore part of the back each hair has two yellow rings. The tip of the muzzle is dusky; the ears apparently flesh-coloured, with a dusky margin. No crest on the back of the head. Its dimensions are given in column No. 1; those in columns 2 and 3 are from Bolivian specimens.

	No. 1.		No. 2.		No. 3.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length from tip of nose to root of tail ...	19	0	20	0	18	0
" from ditto to ear	3	10	3	9	3	7
" of ear		11	1	0	1	0
" of tarsus, including the nails ...	4	10	5	0	4	9
" of tail, about				9		

Dasyprocta caudata.

Dasyprocta caudata. Lund, Det Kongel. Danske Videnskab. &c. viii. p. 297 (1841).
" *pallida*, of the Leyden Museum.

Fur harsh, pencilled with black and bright yellow, the latter colour slightly prevailing: abdomen yellow; the long hairs covering the hinder part of the back annulated with black white, producing a grey tint.

Inhabits Minas Geraes.

Dr. Lund distinguishes a species of Agouti inhabiting Minas Geraes from the *D. Azaræ* by its being of larger size, by the greater length of its tail, and the grey colour of the hinder part of the back. The length of the Paraguay animal (*D. Azaræ*), Dr. Lund states, is 18, or sometimes 19

inches, whilst the Minas Geraes Agouti (named *D. caudata*) has an average length of 20 inches, and specimens are met with which exceed that length. The tail in the *D. Azaræ* is half an inch, whilst that in the *D. caudata* is an inch in length. Of two adult skulls of the last mentioned animal, one measured 4″ 1‴, and the other 4″ 4‴: this second skull belonged to a male, whilst the first was that of a female. The length of the skull of the adult *D. Azaræ* is given at 3″ 2‴[1].

The hairs of the fur of the *D. caudata* are said to be annulated with black and yellow, the general hue being olive-grey; the yellow becoming more distinct towards the abdomen, which is of a sulphur yellow: the extremities black, and the rump grey; a tint produced by the long hairs on this part being annulated with black and white.

Two Agoutis in the Leyden Museum are clearly referrible to this species: they are about equal in size to the *D. cristata*, and their ears, as in that animal, are smaller than in the *D. Aguti*. The hairs of their fur are harsh, and pencilled with black and yellow, the bright colour prevailing somewhat over the dark. Each hair on the back is of a bright yellow colour; nearly white at the root, and with three or four black rings. The long hairs over the rump are white, and have five or six black rings; the black and white occupying about equal portions of each hair. The chin and throat whitish; the abdomen bright yellow. The ears are clothed with hairs, which are of a rusty yellow colour, except near the apex, where the hairs are dusky, as are also those on the fore part of the outer surface. In one specimen the feet are black; and in the other they are black, pencilled with yellow[2].

[1] The dimensions of the *D. Azaræ* are taken by Lund from Dr. Rengger's account of that animal.

[2] Dr. Wagner will not admit that the *D. caudata* is distinct from the *D. Azaræ*, since (as he states in his Report on Zoology for 1842) among the

	Inches.	Lines.	Inches.	Lines.
From tip of nose to root of tail ...	21	0	22	0
" ditto to ear, about			4	0
Length of ear, about		9		9½
Width of ear	1	4	1	4
Length of hind foot and nails	4	6	4	9
" of fore foot and nails ...	2	2	2	3

DASYPROCTA ACOUCHY.

The Acouchy, or Olive Agouti.

Cavia Acouchy.	ERXLEBEN, Systema Regni Animalis, p. 354 (1777).
" *Acuschy.*	GMELIN, Linn. Syst. Nat. i. p. 121 (1788).
" *Acuchy.*	SCHREBER, Säugth. iv. p. 612, Pl. 171 B (1792).
" *Acuschy.*	SHAW, General Zoology, ii. Pt. 1, p. 27, Pl. 126, (1801).
" *Akuchi.*	DESM., Nouv. Dict. d'Hist Nat. i. p. 212 (1816).
Dasyprocta Acuschy.	DESM., Mamm. ii. p. 358 (1822).
" "	WAGNER, Schreb. Säugth. Suppl. iv. p. 48 (1844).
" *leptura.*	(NATTERER) WAGNER, l. c. p. 49.
" *exilis.*	WAGLER, in Isis, 1831, p. 619.
" *leporina*[1].	GRAY, List of the Mammalia in Brit. Mus. (184 3),

numerous Brazilian specimens contained in the Vienna collection, all of which he regards as the *D. Azaræ*, there are some in which the rump passes into grey; and, as he moreover affirms, there is no difference in size between these animals and the *D. caudata*. As, however, my own observations confirm Dr. Lund's, with regard to the superior size of the *D. caudata*, as compared with the *D. Azaræ*, and as Dr. Wagner has omitted to notice the most important point dwelt upon by Dr. Lund, viz. the great difference of size in the skulls of the two animals, it may be questioned whether the Vienna specimens referred to, do all actually belong to one species. They were collected in the province of San Paulo, which lies between Minas Geraes and Paraguay, and upon the supposition that the Agouti of one of the two latter districts is specifically distinct from that of the other, it is highly probable that the intervening country would be inhabited by both species. The *D. Azaræ*, however, would appear to be the more common species in the province of San Paulo, for Dr. Wagner, in his continuation of Schreber's great work, only notices one amongst the numerous specimens brought by Dr. Natterer from that province—"a full-grown male"—in which the hinder part of the back is grey.

[1] The *Dasyprocta leporina* of authors is founded upon a figure of a Rodent (called the Java Hare) given in Catesby's Carolina (Appendix, Pl. 18), and is

Akouchy. BARRÈRE, Essai sur l'Hist. Nat. de la France Equinoxiale, p. 153 (1741).

Akouchi. BUFFON, Hist. Nat. xv. p. 158 (1767); Suppl. iii. p. 211, Tab. 36 (1776)

Olive Cavy. PENNANT, Synopsis of Quadr. p. 246 (1771).

Tail slender, about two inches in length, and covered with white hairs on the apical half: general hue of the fur chestnut brown (the hairs pencilled with brown-black, and rich yellow-brown); hinder part of back dusky; under parts of the body of a deep golden yellow; feet rufous-yellow, obscurely pencilled with black; a bright rufous, or golden yellow spot behind each ear.

Inhabits some of the West India Islands (St. Lucia and Grenada), Guayana, and the northern parts of Brazil.

The Acouchy is a delicately made little animal, much smaller than either of the preceding species of Agouti, and readily distinguished from that circumstance, combined with the greater length as well as the slenderness of its tail. This organ is not naked as in other species of Agouti, but is tolerably well clothed (on the apical half at least) with silvery white hairs, of from one to two lines in length. Another character which will help to distinguish this species is the conspicuous bright rust-coloured, or golden yellow patch, which is situated immediately behind the ear. Its general colouring varies somewhat, but in most specimens

the *Cuniculus Javensis* of Brisson, *Mus leporinus* of Linnæus, and *Cavia leporina* of Erxleben. That it is an Agouti there can be no doubt, and that no such animal inhabits Java and Sumatra, as was supposed, is equally certain. According to the text of Catesby's work, it was of a reddish brown colour, had a very short tail (represented in the figure as a mere tubercle, like the tail of *Dasyprocta Aguti*), and was equal in size to a Hare. These last two points show that it could not be the Acouchi, that animal having a comparatively long tail, and being of much smaller size; and hence I cannot see the propriety of changing the specific name which has been attached to that anima so many years

which have come under my notice, it may be described as rich chestnut brown — shaded almost into black on the hinder half of the back—a tint produced by the mixture of brown-black, and rufous or bright rust colour; the ground colour of each hair being dark, and the brighter colour forming two or three rings on each hair. The whole under parts are of a bright rufous, or sometimes golden yellow hue; and the fore legs, and fore part of the hind legs, are nearly of the same colour, but usually somewhat richer, and may be described as of a deep orange red tint; the feet are of this latter colour, but rather obscurely freckled with black. The ears are of moderate size, flesh-coloured, and very sparingly clothed with hairs. The hairs of the moustaches are black: the angle of the mouth is whitish. There is usually a slight pencilling of black on the chest.

In some specimens the brown-black of the fur is replaced by pure black, the paler annulations of the hairs incline more to yellow, the abdomen is of a less deep golden yellow, and the hinder half of the back is black. The bright spot behind the ear is always distinct.

In a female specimen in the British Museum I found eight mammæ: it agrees in its colouring with my general description[1]. A specimen in the same collection, agreeing with the second description, is apparently a male[2].

[1] The dimensions of this animal are given in column No. 1.

[2] See its anmeasurements (in which those of the skull are included) in column No. 2. The dimensions in columns 3 and 4 are taken from specimens in the museum of the Zoological Society.

	No. 1.		No. 2.		No. 5.		No. 4.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length from tip of nose to root of tail	14	6	13	6	13	6	14	0
" from nose to ear	2	9	2	9	2	8	2	8
" of ear		9½		9		8		8½
" of tail	2	0	2	2			1	10
" of hind foot, without the nails	3	3	3	0	2	3	3	1
" of nail of middle toe ...		5½		6½				
" of skull			3	4	3	2		
Width of ditto			1	7½	1	6		
" " between orbits ...				11		10¾		
Length of nasal bones			1	1⅓	1	0⅓		
Width of ditto				6		6		
From incisor to molar teeth ...				10½		9⅓		
Length of four upper molars, together				6¼		6⅓		
Width of upper incisors ...				2⅓		2⅓		
" of palate, between the molars				3⅓		3¼		
Length of zygoma			1	2¼		2		
" of lower jaw			1	11		10		
Height of ditto				9¾		10		
Length of angular portion ...				11		10½		

The skull of the Acouchy has the post-orbital process of the frontal and malar bones more developed than in the crania of any other Agoutis which have come under my notice. The post-orbital process of the malar bone is removed from the malo-maxillary suture by about one line. The sagittal crest is more distinct, and more elongated, than usual. The posterior emargination of the palate terminates in a line with the interspace of the last and penultimate molars. The ant-orbital opening is enclosed in front, as usual, by a portion of the superior maxillary. I have not seen a cranium of any Agouti in which the lachrymal bone forms any part of the bony ring which encloses the ant-orbital opening, as noticed

by Cuvier in the Agouti skull described in the *Ossemens Fossiles*.

For a detailed account of the anatomy of this animal, we must refer to Professor Owen's papers in the Proceedings of the Zoological Society[1].

With regard to the habits of the Acouchy, we are not aware that it differs in any important point from the other species of Agouti. The following short notice from the pen of Prof. Bell[2] well depicts the habits as noticed in two specimens which that gentleman received alive from Guayana. After calling attention to the chief points of distinction between the Acouchy and Agouti, and especially noticing the greater length of the tail in the former, it being upwards of two inches in length in the living animal, and of equal thickness throughout, Prof. Bell observes, that "the animal frequently agitates this organ with a quick tremulous motion. Both the individuals are mild and gentle in their dispositions, but somewhat timid; they are, however, familiar with their master, and run to him whenever he enters the room in which they are kept, and about which they are allowed to range during the day. Their food is entirely vegetable; they are especially partial to nuts and almonds: they drink but little. They are extremely cleanly, and take great pains to keep their fur in order, in cleansing which they mutually assist each other. They leap occasionally in play to a considerable height, and frequently on springing from the ground to an elevation of two feet, descend on the spot from whence they rose. Their voice is a short, rather sharp, plaintive pur. The individuals, male and female, show great attachment to each other."

[1] See p. 75 of Proceedings for 1831, for an account of the viscera; and p. 100 of Proc. for 1832, for the peculiarities of the skeleton. In two specimens examined, Prof. Owen found small clavicles, "about the thickness of a small pin, and eight lines in length."

[2] Communicated to the Zoological Society at the meeting for Nov. 1830.

Dasyprocta leptura. WAGNER.

Judging from Dr. Wagner's description, I feel almost certain that the *D. leptura* is a mere variety of the Acouchy, in which the colouring is somewhat richer than usual. The specimen described was obtained by Dr. Natterer at the Rio Negro, the chief northern tributary of the Amazon. It is said to be freckled with rusty red, and black ; dark on the outer surface of the limbs, and very dark on the hinder portion of the back ; whilst on the sides of the body the rusty red prevails, the black gradually disappearing towards the under parts, which are of an uniform rusty yellow colour. The tail is slender, and has scattered reddish hairs, except at the point, where the hairs are whitish. Length, 12″ 2¼‴ ; tail, 2″ 0‴ ; ear, 1″ 2½‴.

Dasyprocta exilis. WAGLER.

That this supposed species is founded upon a young specimen of the Acouchy, in which the tail has been lost, I feel but little doubt. According to the description, it has the general colouring of the Acouchy, and the bright patch behind each ear, which is always seen in that animal. Its length is said to be 9½ inches : the upper parts of the body brownish chestnut, freckled or pencilled with black, and the under parts reddish fulvous, but with a white stripe in the mesial line. This white stripe I have not noticed in the specimens of Acouchy which I have described, but I have observed that a white stripe, on the abdomen, is either present or absent in different individuals of several species of Agoutis. The specimen from which Dr. Wagler drew up his description was brought by Spix from the Amazon district.

Dasyprocta albida.

Dasyprocta albida. GRAY, Annals and Magaz. of Nat. Hist. for Dec. 1842, vol. x. p. 264.

The specimen described by Mr. Gray under the above name, is in such a bad condition—a skin deficient of the fore legs, and otherwise imperfect—that all that can be said about it is, that the animal must have been about equal in size to the Acouchi: its fur is long and coarse, and of a lead-grey colour, but very pale—inclining to white; all the hairs are white at the root, and there is a whitish patch above, and another below the eye. The hind foot (including the nails) is 3″ 5‴ in length; and the naked under surface, instead of being black as in other Agoutis, is of a flesh colour. It is from I. St. Vincent, West Indies, and possibly may be an accidental variety of the Acouchi, which is said to inhabit the neighbouring Islands.

SUB-FAMILY, HYSTRICINA.

Hystrices. BRANDT.

Hystricidæ with rooted, or semi-rooted molars; skull with the malar bone destitute of angular process on the lower margin; frontal bones very broad; feet short, the toes 5—5, 4—5, or 4—4; body more or less armed with spines.

Inhabit all the four quarters of the globe.

The *Hystricina*, or true Porcupines, form the subject of an excellent monograph by M. Brandt[1], who divides the group into two minor sections. One is composed of Porcupines which live upon the ground, and seek shelter in burrows which they themselves form. They have five toes both to the fore and hind feet; the soles of the feet naked and

[1] Mammalium Exoticorum Novorum vel minus Cognitorum, &c., 4to. Petrop. 1835, being a collection of papers upon Mammalia, originally published by the Author in the Transactions of the Imperial Academy of Sciences of St. Petersburgh, 6th Series, vols. ii. and iii.

smooth: the skull more or less elongated, and provided with a distinct lachrymal bone, which partly encloses the lachrymal foramen. The molar teeth semi-rooted, and arranged in parallel series; those of the upper jaw have one internal fold of enamel, and three or four folds entering from the opposite side of the tooth, but which soon assume the form of small isolated areas, disconnected with the margin of the tooth. The lower molars are like the upper, but with the enamel folds reversed in position. The species of this division are confined to the Old World, whilst those of the next are peculiar to the New. The latter are grouped by Brandt under the head *Philodendræ*, from their habit of climbing trees—indeed, they almost entirely live in trees. Their feet are usually provided with but four toes, and these are nearly equal in length, armed with long, compressed, and curved claws; sometimes, however, the hind foot has five toes. The soles of the feet are thickly studded with minute, depressed warts. Their skull is short and broad, and is provided with a minute lachrymal bone, which forms no part of the lachrymal canal; the portion of the palate which lies between the molar teeth is distinctly on a lower level than the anterior portion, and the bony partition which separates the incisive opening (being part of the intermaxillaries) runs back above the palatal portion of the superior maxillary bones; whilst in the Old World Porcupines the incisive septum joins the superior maxillaries by a serrated suture, and is continuous with the plane of the palate, which latter is throughout on the same level[1]. The series of molar teeth of opposite sides of the jaw converge in front: these teeth are distinctly rooted. Each molar has a distinct fold of enamel on either side, and the crown, when but little worn, presents a deep

[1] Distinct anterior and posterior clinoid processes bound the pituitary depression in the skulls of the Old World Porcupines, but are wanting in the New World species.

transverse cavity, surrounded by enamel on each of the two lobes which are separated by the enamel folds. Incisor teeth small. To this division belong the genera *Erethezon*, *Cercolabes*, and *Chætomys*. The last named genus differs considerably in the structure of its molar teeth, and in some other points, from the typical *Philodendræ*. The section *Philogæa* contains the genera *Hystrix* and *Atherura*. We will commence with the American Porcupines.

Genus, *Chætomys*.

Chætomys. GRAY, Proceedings of the Zool. Soc. for Feb. 1843, p. 21; Voyage of the Sulphur—Mamm. p. 36.
Plectrochærus. PICTET, Revue Zool. 1844, p. 225.

Hystricina with the molar teeth longer than broad; each upper molar divided by transverse incisions into three lobes, of which the middle lobe is narrow and transverse, and the remaining two, which are broader, have each a deeply indenting fold of enamel, which enters from the outer side of the tooth: lower molars with one internal, and two external folds of enamel. Skull with the malar bone very deep in front, and throwing out a post-orbital process which nearly meets a corresponding process of the frontal bone; the palate contracted: head and body covered, nearly throughout, with slender, cylindrical, waved spines: tail clothed with short stiff hairs.

The genus *Chætomys* contains but one known species, an animal which has usually been associated with the *H. prehensilis* and *H. insidiosa* of authors, but which, as Mr. Gray has pointed out, differs considerably from other species of Porcupines, in the structure of its skull, as well as that of the teeth. M. Pictet has also called attention to these differences, but not being aware that the animal in which he noticed them had been previously described, applied to it a new specific, as well as generic name. With regard to the

structure of the cranium, the most striking peculiarity consists in the orbital fossa being almost perfectly separated from the temporal, by the large post-orbital processes of the malar and frontal bones: the apices of these processes are only separated, in one skull before me, by a space of about one line, and in a second cranium they are still more nearly united. The malar bone is deeper than in any other Rodent, if we except the Paca. Compared with the crania of the Prehensile-tailed Porcupines, the skull of the Chætomys, moreover, presents these differences, that the portion of the palate which lies between the molar teeth is more elongated, and more contracted, and that the bony tube of the ear is elongated. The temporal ridges are prominent, and as they are continued backwards from the post-orbital process they converge but little. Another ridge, marking the points of insertion of the temporal muscles, runs obliquely downwards and backwards from beneath the post-orbital process: on this ridge is seen the suture which separates the frontal from the squamosal bone. I notice this, not as a peculiarity in the present skull, for this ridge is very characteristic of the crania of the New World Porcupines—differing here only in being oblique in its position instead of vertical, as in other species. The nasal bones are of moderate size, and their length exceeds their combined width by about one-third.

The incisor teeth are rather small, about equal in depth and width, and but slightly convex in front. The molar teeth are relatively longer and narrower than those of other Porcupines, and they are less distinctly rooted than in the following species of the New World section. Their length exceeds their width by about one-third. Each upper molar has the grinding surface divided into three lobes by two transverse incisions, which enter deeply into the body of the tooth: the middle lobe is narrow and transverse; the remaining two lobes are nearly oval, with the long diameter in the transverse

direction of the tooth; and each of these lobes has a deep fold of enamel entering from the outer side[1]. When considerably worn this fold is isolated from the margin of the tooth. The lower molars have each one external fold, and two internal folds of enamel; the hindermost of the two internal folds, after penetrating pretty deeply into the body of the tooth, bifurcates[2]. The tail is moderately long, and nearly resembles that of the Common Rat, being distinctly covered with scales, and rather scantily clothed throughout with hairs, which, though short, are, however, relatively longer than in the Rat's tail. This organ has the hairs worn off from the upper surface of the apical portion, and is no doubt prehensile; but we are led to conclude that the power of grasping objects is less developed in the tail of the Chætomys than in that of the species of the genus next to be described (*Cercolabes*), since it is not distinctly thickened at the root *as in those animals. The feet present the same structure as* in the Cercolabes; the naked surface beneath is studded with minute tubercles; the toes are sub-equal, with long, much arched, and compressed claws; the fore part of the foot (both of the fore and hind leg) is narrow, and the hind part broad, having a large and nearly semicircular lobe on the inner side; the inner toe and the thumb are represented by a small nailless tubercle only.

CHÆTOMYS SUBSPINOSUS.

The Chætomys.

(*Plate* 21, fig. 1).

Hystrix subspinosa.	(Lichtenst.) Kuhl, Beiträge, p. 71 (1820).
" "	Pr. Maxim., Beiträge, ii. p. 440 (1826).
Chætomys subspinosus.	Gray, Proceedings of the Zool. Soc. for Feb. 1843, p. 21; Voyage of the Sulphur—Mamm. Pt. 2, p. 36, Pl. 18, figs. 1—6 (skull), July, 1843.

1 Plate 18, fig. 1 *a*. 2 Plate 18, fig. 1 *b*.

Plectrocœbrus Moricandi. Pictet, Révue Zoolog. Aug. 1843, p. 225—7.
Cercolabes (Sphiggurus) subspinosus. Wagner, Schreb. Säugth. Suppl. iv. p. 35 (1844).
Hystrix tortilis. Illig. Olfers, Neue Bibl. der Reisebeschr. xv. p. 211[1].

General hue dull brown (sometimes varied with grey-white); under parts of the animal inclining to rufous-brown: tail and feet brown-black.

Inhabits the middle and northern parts of Brazil.

Specimens of this animal have been brought from Bahia, and the individual described is said to be from Cometa, in North Brazil. Of its habits we have no information. Its clothing consists of modified hairs, which may be described as presenting a condition intermediate between spines and bristles—stouter than the latter, and more flexible than the former. On the head, shoulders, and fore parts of the back, being rather stouter than elsewhere, and not yielding to the touch, the term spine would not be inaccurately applied to these modified hairs. On other parts of the body there is but little difference in the character of the hairs, excepting in their length[2]. They are waved like the strong bristles which spring from the sides of the muzzle in the Seal: those on the hinder part of the back, which are the longest, measure, most of them, about two and a half inches in length, whilst those on the head scarcely exceed half an inch in length. The general colour of the animal is dull brown; sometimes rufous-brown, richer on the under parts than the upper, and somewhat variegated with grey-white on the latter parts. This general tint arises from the visible half of the hairs being of a dark brown colour below the points, and pale brown at the point; or, in some specimens, there is a broad subterminal grey-white ring. The basal half of each hair is

[1] Quoted from Dr. Wagner's continuation of Schreber's great work on Mammalia; Olfers' work I have not been able to consult.

[2] A spiny hair of the back is represented in Pl. 21, fig. 1 *a*.

often pure white, and sometimes yellow-white. The tip of the muzzle is clothed with very short and slender hairs. The feet are also clothed with short hairs, and these are of a brownish black colour: the nails are pale brown. About two inches of the basal portion of the tail is clothed (on the upper surface at least), with long hairs like those on the back; the lower surface of the tail at the root is densely clothed with short stiff black hairs; and moderately stiff black hairs, about two lines in length, are seen on the remaining portions of the tail; though tolerably abundant, they are not sufficiently so to hide the scaly skin beneath. The ear is very small, and hidden, but the long dusky hairs, with which they are clothed, are conspicuous. The hairs of the moustaches are black. Three specimens of this species of Porcupine are contained in the British Museum collection. I add the dimensions of two of these, together with those of their skulls. They are adult animals.

	Inches.	Lines.	Inches.	Lines.
Length from tip of nose to root of tail	18	0	17	6
" of tail	11	0	10	6
Nose to ear	2	7	2	7
Length of fore foot and nails ...	1	11	1	10
" of the nails of the middle pair of toes		6		5
" of hind foot and nails ...	2	8	2	7
" of nail of second toe		7		6
Length of skull[1]	3	1		
" " to hinder root of zygoma	2	3	2	3
Width of ditto	1	9⅔	1	8
" between orbits	1	0	1	0¼
" immediately behind post-orbital process	1	5	1	4½
" from the apices of the post-orbital processes	1	8	1	7
Length of nasal bones				11¼
Width of ditto behind		6⅓		7
" in front				6½

[1] Pl. 18, fig. 1—⅔ds. nat. size.

Length of frontal bones, measured in the mesial line			1	3
Width of terminal portion of nasal process of intermaxillary bone .		1⅓		1⅔
Length of zygomatic arch	1	4	1	4½
" of orbital fossa		7		6¾
" of temporal fossa		7½		7
" of malar bone	1	4	1	1½
Height of malar bone in front ...		6⅔		7
" " beneath orbit		5¼		5½
" " from the apex of the post-orbital process ...		6⅔		7½
" immediately in front of zygomatic process of temporal bone		2½		2¾
Width of incisors		2¼		2⅓
From incisors to molar teeth		11		10⅔
Length of four upper molars, taken together		9¼		9¼
Width of palate between the foremost molars		2⅛		2⅛
" " between the hindermost molars		3		3
Length of lower jaw			2	1
Height of ditto, measuring from the condyle				11
Length of angular portion				10½

Genus, *Cercolabes*[1].

Cercolabes. Brant, Mém. de l'Acad. de St. Pétersb. 1835, VIme. Sér. tom. iii., Sci. Nat. tom. i. p. 391 ; Mamm. Exoticorum novorum vel minus rite cognitorum, &c. p. 55. 1835.
" Wagner, Schreb. Säugth. Suppl. iv. p. 29. 1844.
Coendu. Lacep. Tabl. 1803.
Coendous. Desm., Mamm. Pt. 2, p. 345. 1822.
Synetheres et *Sphiggurus.* F. Cuvier, Mém. du Mus. d'Hist. Nat. ix. p. 427. 1822.

Hystricina with the body (excepting on the under parts) covered with spines, or with spines and hairs ; the under parts sometimes with spiny hairs ; tail long and prehensile ; feet with four toes, armed with long and curved nails ; the hind foot, moreover, with a rudimentary inner toe, represented by a

[1] From χέρχος, a tail ; and λαμβάνω, to grasp.

small nailless tubercle ; the palm of this foot much expanded: incisor teeth narrow, and sub-compressed; molar teeth nearly equal in size, of a subquadrate form, and the series of opposite sides of the jaw converging in front; each molar divided into two principal lobes by a deeply-indenting fold of enamel on either side, and each lobe presenting a transverse area surrounded by enamel.

Inhabit America, extending from Brazil, in the northern direction through Peru into Mexico, and in the southern direction into Paraguay and Bolivia.

The animals of this section living upon trees, are expert climbers, but their movements are slow. In many climbing mammals the hind foot is provided with a large thumb opposeable to the toes, and thus capable of grasping objects, but in the Tree-Porcupines the same end is accomplished by different means. The naked soles of the feet are expanded, and present a rough surface; the nails of the toes are very long, compressed, and curved; the hind foot is articulated with the leg in such a manner that the sole is directed inwards, and, to compensate for the want of a thumb, a large, and nearly semicircular lobe may be observed projecting from the inner side of the foot, which not only extends the surface of the sole, but which the animal has the power of bending inwards to a certain extent: this lobe is supported internally by several bones; the fore part, by the bones of the inner toe, of which there are two, a broad and tolerably long metatarsal, and one phalanx; the hinder part, by two other bones which have no analogue in the tarsus of many mammals[1]; one of these—a large bone[2]—is attached to the outer side of the navicular end of the astragalus, with which it articulates by a concave surface: to its lower side is joined the

[1] In several Rodents, however, supernumerary bones have been noticed in the same part.

[2] Marked with an asterisk in fig. 4 of Pl. 18, which represents the tarsus of one of these animals.

cuneiform of the thumb, and to its outer side is attached the second supernumerary bone[1], which is hatchet-shaped, narrow internally, where it articulates with the first-mentioned supernumerary bone, and expanded externally. The articular surface of the astragalus for the tibia is directed inwards, whilst that for the fibula is directed upwards, and hence the oblique position of the foot. In the fore foot, which also has a lobe on the inner side, though of smaller size than that of the hind foot, there is also a hatchet-shaped bone; this articulating with the large bone formed by the anchylosis of the scaphoid and lunare; and, as in most other Rodents, there is a small extra bone wedged in between the scapholunare, the trapezium, and the os magnum: the thumb has but one phalanx. The tibia and fibula, as in other climbing mammals, are widely separated, excepting at the extremities. In addition to these modifications, adapted to the climbing habits of the animal, we have to notice, that it has a long tail, which is thick and muscular at the base, and somewhat slender at the opposite extremity, where the absence of hair, on the supper surface, shows that that part is used in grasping. In ascending the trunk of a tree it is stated that the Tree-Porcupine uses its feet only, but when in the tops of the trees, which it seldom quits, it derives assistance and security from its tail, the end of which it coils round the slender branches. Here it is the upper surface of the tail which is applied to the branch, and the organ is therefore coiled in the reverse direction to that of the Prehensile-tailed Monkeys which inhabit the same country. Judging from the peculiar covering of the under surface of the basal half of the tail—which, as I have before said, is very powerful—one may suppose that when the animal is on a thick vertical branch, where the organ could not be used for prehension, it may still be of considerable assistance in supporting the

[1] Marked with a double asterisk in the figure.

body, and in such a manner as to leave the fore limbs free, in case they should be required for holding the food, which, in nearly all Rodents, is taken in the fore paws. The covering of the part of the tail in question, consisting of a very dense mass of short and stiff bristles, the points of which are directed backwards, would, when closely applied to the branch, afford a strong resistance; and, combined with the lateral pressure of the hind feet, suffice to sustain the body of the animal securely.

It needs only further to be added, with respect to the structure of the feet, that of the toes of the fore feet, the middle two are nearly equal in length, and the remaining two are nearly equal to each other; the inner toe, which is slightly the shorter of the two, has its nail terminating in a line with the middle portion of the nail of the adjoining toe. The toes of the hind feet are very nearly equal in length.

The muzzle of the Tree-Porcupines is thick, and obliquely truncated, so that the upper portion projects slightly over the lower part: the nostril openings are large, nearly round, and approximated, and are scarcely visible when the muzzle is viewed laterally. The whole of the muzzle[1] is clothed — rather sparingly—with minute velvet-like hairs. The upper lip is slightly notched, or emarginated immediately above the incisors, but presents no vertical groove. The eyes are small, but prominent: the ears are likewise small, and sparingly clothed with fine hairs, excepting on the inner surface of the lobe, where there is a tuft of long and stiff hairs.

The skull of these animals[2] is short and broad; the zygoma is somewhat slender; there is scarcely any trace of a post-orbital process either to the malar bone or the frontal: the ant-orbital opening is large, and enclosed externally by a

[1] See Plate 6 *a*, figs. 6 and 6 *a*.
[2] Pl. 81, figs. 2 and 3.

process of the superior maxillary only. The palate is rather deeply emarginated behind, and contracted between the foremost pair of molar teeth, where its width is usually about equal to the width of one of the molars: the auditory bullæ are moderately large, and the ear opens directly into the chamber without any prolonged tube. The molar teeth[1] are perfectly rooted, nearly equal in size, and their crowns are of a sub-quadrate form. Each of the upper molars has a moderately deep fold of enamel on the inner side, which runs obliquely inwards and forwards from the posterior angle of the tooth, and a still deeper enamel-fold on the outer side, which runs directly inwards, and meets that of the opposite side. Before the crown of the tooth is worn, each half presents a concavity surrounded by enamel, which is in contact with that which surrounds the lobe externally; but, the concavity being shallow, its area becomes contracted in proportion as the tooth wears, and in a moderately aged animal we find it represented only by a narrow transverse groove, surrounded by enamel, which is distinctly separated from that of the outer surface of each half of the tooth. Besides the principal enamel folds, there is a very small fold entering from the back of the molar, and which is often very indistinct. The hindermost upper molar is a trifle smaller than the others. The lower molars resemble the upper, excepting that the enamel-folds are reversed in position—thus, the oblique fold is on the outer side of the tooth—and, excepting that the foremost molar is longer and narrower than the rest, and its foremost lobe is distinctly smaller than the hinder lobe.

In a female Cercolabes described by Azara, that author found four mammæ, and I have found the same number in the female of a different species of the same genus—the *C. Novæ-Hispaniæ*[2]. This animal, which I examined immediately

[1] Pl. 18, fig. 3 *b* (1st and 2d right upper molars).

[2] On each side of the body I found a nipple situated at a distance of about

after death, as well as two specimens of the *C. prehensilis*, emitted the strong and disagreeable odour (somewhat resembling that of garlic) which has been noticed in other species.

The food of the Tree-Porcupines is said to consist of the fruits and leaves, as well as the tender bark of trees. These animals are usually seen singly; they pass the hot parts of the day in sleep, and seek their food in the morning and evening. They are very inoffensive, and soon become reconciled to captivity, though they show very little intelligence. The spines, or quills, with which they are armed, are barbed, that is, they have at the pointed end numerous minute spines (visible only with a lens), the points of which are directed backwards; and, as the quills are but loosely attached to the skin, it may occasionally happen that their points having pierced some object, the quills themselves may become detached from the animal and remain sticking in that object: and this circumstance perhaps has given rise to the erroneous statement made by some of the older authors, who have attributed to these animals the power of shooting their quills.

The Prehensile-tailed Porcupines are divided by M. F. Cuvier[1] into two genera—*Synetheres* and *Sphiggurus* (or, more correctly, *Sphingurus*), these being distinguished chiefly by certain peculiarities in the structure of the cranium. M. Brandt, regarding the peculiarities in question as of

two inches behind the base of the fore leg, and a second about an inch and a half behind this. The foremost pair were somewhat approximated, being only an inch and a half apart: the hinder pair were rather more widely separated.

[1] To M. F. Cuvier is due the credit of having first divided into sections the various very dissimilar animals previously associated under the name *Hystrix*, and for having carefully defined most of those sections.—See M. Cuvier's memoir entiled "Examen des espèces du genre Porc-épic, et formation des Genres ou Sous-Genres *Acanthion, Eréthizon, Sinéthère* et *Sphiggure*," published in the ninth volume of the Mémoires du Muséum d'Histoire Naturelle.

minor importance, links the two above-mentioned sections together under the generic title *Cercolabes*, but adopts M. Cuvier's sections as sub-genera. The essential distinction of the species of the sub-genus *Synetheres*, according to M. Brandt, is, that they have the under part of the neck, and the chest and abdomen, as well as the inner surface of the limbs, covered with bristles of a more or less spiny nature; whereas those of the sub-genus *Sphingurus* have the same parts clothed with hairs only. Upon this distinction I may remark, that if we take a typical species of each section, viz. *C. prehensilis* for the section *Synetheres*, and *C. villosus* for the section *Sphingurus*, we might add that the *Synetheres* type is further distinguished by the upper surface of the cranium being very broad and convex, and the spines of the body being in no way hidden by fur; whilst in the *Sphingurus* type the spines are almost entirely hidden by a fur composed of very long hairs, and the skull is less broad between the orbits, and nearly flat in the same part. Now, an animal unknown to M. Brandt (the *C. Novæ-Hispaniæ*) presents all these characters noticed in the *C. villosus*, but has tufts of spiny bristles on the under parts of the body interspersed with a soft fur.

Regarding the distinctions just noticed as specific rather than as sectional, I will describe these animals under Brandt's generic name, and will first characterize those species in which the body is almost destitute of hairs, being covered with spines, and, in part, with spiny bristles.

CERCOLABES PREHENSILIS.

Brazilian Tree-Porcupine.

Hystrix prehensilis. **Linn., Syst. Nat. ed. 12, p. 76.**
" " **Schreb., Säugth. iv. p. 603, Pl. 168.**
" " **(Prehensile Porcupine). Shaw, Gen. Zool. ii. Pt. 1, p. 7, Pl. 123.**

Hystrix Cuandu.	DESM., Nouv. Dict. d'Hist. Nat. vi. p. 44; Mammalogie, p. 316.
Synetheres prehensilis.	F. CUV., Mém. du Mus. ix. pp. 427 and 433, Pl. 20 ter. figs. 3 and 4 (skull); Dict. des Sci. Nat. xlii. p. 533.
" "	IS. GEOFF., Dict. Class. d'Hist. Nat. xiv. p. 215.
Coendu prehensilis.	LESSON, Manuel de Mamm. p. 291.
Cercolabes (Synetheres) prehensilis.	BRANDT, Mamm. Exoticorum, &c. p. 60, Pl. 9, figs. 5—9 (skull).
" " "	WAGNER, Schreb. Säugth. Suppl. iv. p. 30.
Brazilian Porcupine.	PENNANT, Synopsis of Quadr. p. 264, Pl. 24, fig. 1.
Le Coendou à longue queue.	BUFF, Hist. Nat. Suppl. vii. p. 305, Pl. 78.
Le Coendou.	F. CUV. et GEOFF., Hist. Nat. des Mammif. Fasc. 46.

Body covered with spines having a circular section, and which are white at the base and apex, and black in the middle—when in their ordinary position the black and white show in about equal proportions: under parts with spiny bristles: tail nearly equal to the head and body in length, the basal third armed with spines above; the terminal third (or less) naked above, and the remaining portions clothed with stiff hairs, which are for the most part black—sometimes dusky and dirty white.

Inhabits Guiana, Brazil, and Bolivia.

This animal is frequently met with in Brazil and Guiana, and it occurs likewise in Santa Cruz de la Sierra, a district of Bolivia in which nearly all the Mammalia are identical in species with those of Brazil. Mr. Bridges, who brought to England specimens from this locality, informs me that it is most frequently seen on the Palm trees, and that it feeds upon the fruits of those trees.

On more than one occasion I have had an opportunity of seeing the Brazilian Porcupine alive, in the menagerie of the

Zoological Society, but I noticed no peculiarities of habits worthy of remark: excepting when tempted by food, it seldom descended from a perch which was placed in its cage, and on which it sat, resting entirely upon its hind feet, the long tail hanging down, and serving no doubt as a balance to the anterior part of the body, which was curved forwards and downwards, so as to bring the head nearly in contact with the feet: at such times the head would barely be distinguished from the round ball of spines which the animal resembled, were it not for the protrusion of the large fleshy muzzle; a part which, when the animal was the least excited, was almost constantly in motion.

The *C. prehensilis* is usually from about sixteen to eighteen inches in length, without including the tail, which measures but a trifle less. The upper surface of its head is much arched; the muzzle is very prominent, slightly recurved, rounded at the apex (with a slight depression, however, in the mesial line), and nearly flat in front, where, about midway between the upper surface of the nose, and the edge of the upper lip, are placed the nostril openings, which are moderately large, nearly round, but slightly pointed above, and are separated by a space of about one-sixth of an inch. The whole surface of the muzzle (with the exception of a narrow naked space round each nostril) is somewhat scantily clothed with small velvet-like hairs, mixed with which are some longer and coarser hairs, and, as usual, the long coarse hairs of the moustaches which take their origin on the sides of the muzzle. The chin is clothed with fine hairs like the muzzle, but all other parts of the head, as well as the body, are covered with spines, or spiny bristles. The spines commence at the distance of about half an inch in front of the eye, and are at first short and small, but rapidly increase in size as they spring from parts more remote from the muzzle; and on the middle of the back they attain their greatest length, which is

about three and a half inches: here they have a diameter of one line, or a trifle more. The spiny bristles on the under parts of the body are short, white at the root, dusky in the middle, and white again at the point. Upon separating them, a very scanty growth of short and thin hairs is visible. The outer surface of the limbs is clothed with spines like the sides of the body, but towards the feet they become smaller, and are mixed with hairs. Besides the spines, a few very long bristly hairs spring from the legs, and sides of the body.

The feet are clothed with coarsish, party-coloured, dusky and whitish hairs: the toes are scantily clothed. The tail is covered above for about one-third of its length (or sometimes for half its length), with spines like those on the upper parts of the body, but the area thus covered gradually becomes narrower from the base of the tail, until it terminates in a point: about one-third (or rather less) of the apical portion of the tail is naked above, and the remaining portions are clothed with coarse hairs averaging about half an inch in length; on the under surface of the basal portion they are extremely dense; dusky, with a dirty yellowish tip; towards the end of the tail the hairs become scanty, and do not hide the scaly skin. The naked soles of the feet are brownish, and the naked part of the tail dusky brown. The ear is small, and almost entirely hidden by the spines of the head; it has a few long and very fine hairs scattered over its surface, a tuft of stiff hairs springing from the lobe.

	Inches.	Lines.	Inches.	Lines.
Length from tip of nose to root of tail (in a straight line)	16	0	18	0
" of tail	15	0	17	0
" from nose to ear	2	7		
Width of muzzle	1	4		
Height of ditto, measured from edge of upper lip	1	5½		

	Inches.	Lines.	Inches.	Lines.
Length of fore foot, not including the claws	1	11		
Length of the longest claw		7		
Width of fore foot		8		
Length of hind foot, without the nails	2	9	2	11
" of longest nail		6½		
Greatest width of foot	1	3½	1	4½

The above dimensions are taken from specimens immediately after death, the specimens having lived in the menagerie of the Zoological Society. A specimen in the Leyden Museum, and which is labelled as coming from Surinam, measures 20 inches in length, following the curve of the back; its tail is about 23 inches in length, and therefore proportionately longer than in the animals belonging to the Zoological Society; in other respects it does not differ, excepting that the hairs on the tail are dusky brown.

A specimen, in the British Museum collection, brought from Bolivia by Mr. Bridges, differs from others which have come under my notice, in being of a much paler hue, owing to the white portions of its spines being much more extended in proportion to the dark part; and the dark ring on each spine here assumes a brown-black hue. The dark ring on the spines of the head, as well as on those of the upper surface of the tail (excepting quite at the base) scarcely show, and hence these parts appear to be almost wholly white. The prevailing hue of the hairy portions of the tail is pale ash-colour; the stiff bristly hairs being dirty white, with a narrowish ashy brown ring above the middle. The spiny bristles on the belly are similarly coloured. The hairs of the moustaches are black, but a considerable portion (being the basal portion) of each hair is white; and the few very long bristly hairs which spring from the limbs and sides of the body are party-coloured, black and white. The specimen is a very large female, and exhibits four mammæ; one on each

side of the body, about midway between the fore and hind legs, and a second about midway between this and the base of the fore leg. The animal is about 26 inches in length from the tip of the nose to the root of the tail, and its tail is apparently about 22 inches in length: the hind foot and nails is 4″ 2‴ in length, and the greatest width of this foot is 1″ 10″.

Another specimen in the British Museum is remarkable for its general dark hue, the visible portions of the spines (which are white at the root) being black, with the exception of a short white point, the white being extended not more than two or three lines from the tip of the spines. In several of the spines the white of the point is replaced by pale brownish yellow. The under parts of the body are dusky, but rather finely pencilled with whitish. The hairy portion of the tail is dusky, excepting at the base beneath, where the hairs have brown-white points. Length 21″ 6‴; tail about 19″ 3‴.

The skull of the *Cercolabes prehensilis*[1] is short and broad (the frontal bones very broad) and remarkable for the great convexity of its upper surface. The anterior half of the nasal bones is depressed, but their hinder half rises abruptly to form a continuous curve with the frontals, which curve is most elevated at the fore part of the last-mentioned bones, and gradually descends from that point to the occipital ridge. The series of molar teeth of opposite sides of the upper jaw are separated in front by a space about equal in width to one of these teeth, and they diverge very little behind, in which respect they differ from the molars of the *C. villosus*, where the two rows distinctly diverge. A muscular impression immediately in front of the foremost molar, which is very strongly marked in the skull of *C. villosus*, and some

[1] Plate 18, fig. 2.

nearly allied species, is in the *C. prehensilis* somewhat indisstinct. The auditory bullæ are very large and prominent.

	Leyden Museum. Surinam. Inches.	Lines.	British Museum. Inches.	Lines.
Length of skull	3	3	3	7½
Width of ditto	2	1	2	2¼
" " between orbits ...	1	6	1	6⅔
Length of nasal bones	1	1		0*
Width of ditto, behind	1	0½		
" " in front		11¾		11⅔
From incisor to molar teeth		10½		11
Length of four upper molars, taken together		9		10
Longitudinal diameter of auditory bullæ		9		11
Transverse diameter of ditto		6		6
Length of lower jaw	2	2½	2	4
Height of ditto		11½	1	1
Width of incisors, together		3		3

Cercolabes platycentrotus.

Cercolabes platycentrotus. Brandt, Mém. de l'Acad. de St. Pétersb. l. c. Mammalium Exoticorum, &c. p. 63, Pl. 2.

Body covered above by spines; and beneath by bristles, or spiny-bristles; the spines many of them grooved on the upper surface, the groove either extending from the base to the apex of the spine, or confined to the basal portion.

Habitat ———?

This species is founded on a single specimen in the Museum at St. Petersburg, an animal which we are informed greatly resembles the *C. prehensilis*, but which differs in having most of the spines grooved along the upper or anterior surface, either from the base to the middle, or as far as the point. The spines which are grooved in the whole length are for the most part dilated and broader than the rest. Some there are which are flattened, and which are compared to a narrow corneous

* All the sutures on the upper surface of this skull are obliterated.

lamina, contracted to a point at each extremity. Mixed with the grooved and flattened spines are others which are round, as in the *C. prehensilis*. All the spines are white at the base and apex, and black in the middle, as in the animal just mentioned.

	Inches.	Lines.
Total length of the animal	28	0
Of which the tail measures	14	9
From nose to ear	2	6

M. Brandt observes, with regard to the *C. platycentrotus*, that, although it bears a great resemblance to the *C. prehensilis*, and that individuals of that species are found in which there are a few grooved spines mixed with the ordinary cylindrical spines[1], nevertheless it can hardly be a variety of that animal, since the grooved spines prevail in the *C. platycentrotus*, and, moreover, the flat spines which have been alluded to are tolerably abundant in his animal, and are not found in the *C. prehensilis*. Lastly, in the region of the spiny portions of the tail and limbs there are flat and channelled bristles, which do not occur in the *C. prehensilis*.

CERCOLABES NYCTHEMERA.

Peruvian Tree-Porcupine.

Hystrix nycthemera. (Licht.) Kuhl., Beiträge zur Zoologie, p. 71 (1820).
Sphingurus bicolor. Tschudi, Fauna Peruana, Pt. 4, p. 186, Pl. 15, (1845).

Upper parts of the animal entirely black; the spines very abun-

[1] In the Leyden Museum I saw a specimen which appeared to me to be the *C. prehensilis*, but in which many of the spines were broadly channelled from the base nearly to the apex; its spines were rather longer than those of a specimen of the *C. prehensilis* from Surinam, in the same collection, and differed, moreover, in having the broad dark ring of a dusky brown hue instead of black. It is labelled as coming from Brazil.

dant, with the base white, and the apical third black, very acute, and rather larger than those of *Hystrix insidiosa.*—KUHL.

In addition to the above, we learn from Kuhl that his *H. nycthemera* belongs to the same section as the *H. prehensilis*, has a long tail, and is distinguished from *H. insidiosa* by the absence of long hairs mixed with the spines.

A small Cercolabes in the collection of the British Museum I have little doubt is the young of this species. Its characters are as follows:—

Upper parts and sides of the animal covered with well-developed spines, which hide a clothing of woolly hair; the woolly hair scanty on the back, but moderately dense over the rump, where it is not entirely hidden by the spines. Under parts of the head and body, inner surface of limbs, and fore parts of hind legs, clothed with soft hairs: feet covered with somewhat coarse hairs; tail, for about two-thirds of its length, beneath, covered by dense and stiff hairs; the apical portion rather sparingly clothed with coarse hairs; the upper, basal half, with spines.

Colouring.—The spiny parts of the animal pencilled with black and white, in about equal proportions; the spines being white, with long black points; some of them (more especially those on the haunches) of a pale sulphur-yellow at the root. Under parts palish dusky brown; the hairs being grey-white at the root, and dusky brown, or, some of them, black at the point. Tail black beneath, brown-black at the apex, and pencilled with black and rufous on the sides. Feet dusky brown, with a mixture of rufous-brown: the toes chiefly rufous-brown. The woolly fur hidden by the spines on the upper parts of the body is grey-white. Length of head and body 9½ inches; tail, 9¼ inches.

Habitat, Brazil.

Sphingurus bicolor. TSCHUDI.

The following description of the *S. bicolor*, extracted from

Dr. Tschudi's account of that animal, seems to me to be likewise referrible to the species too briefly described by Kuhl.

Spines of a sulphur yellow colour, with dusky black points, and not intermixed with long hairs: under parts of the body covered by a pale brown fur, mixed with which are some very slender spines.

Inhabits Peru.

Dr. Tschudi informs us that he met with but a single specimen of this animal, and that as the Indians, to whom it was shown, were unacquainted with it, the species must be very rare in Peru. It was procured in the tropical forest on the east side of the Andes.

Judging from Dr. Tschudi's description, the *C. bicolor* must bear considerable resemblance to the *C. prehensilis*, but would be readily distinguished by its spines being black at the point. The same parts are covered by spines as in the animal just mentioned, viz. the upper parts and sides of the head and body, the outer surface of the limbs, and the upper surface of the tail; here leaving the terminal third of the organ unprotected by these weapons. They attain their greatest length on the middle of the back, where they measure 3⅓ inches from the base to the point; and, on the hinder part of the back, they are said to decrease in length rapidly as they approach the tail. It is only on the hinder part of the body, and the outer surface of the hind legs, that hair is found mixed with the spines, and this fur is short, and of a coarse, but woolly nature: its colour is yellow-brown. The spines are of a pale sulphur yellow colour at the base, and black, or brown-black, at the point. The spines being in their ordinary position, the black prevails on the fore parts of the body, whilst the yellow is evident on the hinder parts, and this arises from the degree to which either the dark or pale hue is extended on each spine: thus, on the fore parts of the body, about one-third of each spine is yellow, the point

is brown-black, and the intermediate space is pale brown, the dark and light colours gradually blending: on the hinder parts of the body, sulphur yellow prevails, only about one-fourth or one-fifth part of each spine being black. The spines on the upper surface of the tail are similarly coloured. The throat, breast, belly, and inner surface of the limbs, are somewhat scantily furnished with hairs, which are about a quarter of an inch in length, and mixed with these is a woolly under fur, besides some slender spines. These parts are described as of a very pale, almost whitish brown, colour; the terminal portion of the tail as reddish black, and the feet as dusky. The entire length of the animal is 26 inches, of which the tail is 13 inches.

Cercolabes spinosus.

Sphiggurus spinosus. F. Cuv., Mém du Mus. d'Hist. Nat. ix. p. 433, Pl. 20, ter. figs. 5 and 6 (skull); fig. 7 (feet); Dict. des Sci. Nat. xlii. p. 534.
" " Lesson, Manuel de Mammalogie, p. 291.
" " Is. Geoff., Dict. Class. d'Hist. Nat. xiv. p. 215.

Upper parts covered with spines, which are for the most part tricoloured, white at the base, black towards the point, and orange-red at the point, and in no way hidden by hairs; under parts clothed with woolly hairs, amongst which are intermingled some coarse hairs: spines on the rump, and most of those on the tail, white, with a black point: tail black, except on the spiny portion.

Inhabits Brazil.

The following notes were made upon the specimen preserved in the Paris Museum, there labelled as the *Sphiggurus spinosus* of F. Cuvier, and which I presume is the original of that author's description.

Upper surface of the head, the cheeks, the upper parts of the body, and the flanks, covered with spines; those on the

body being moderately stout. Mingled with these spines are a few inconspicuous slender hairs. Under parts clothed with a woolly fur, but with coarse hairs intermixed, and near the flanks the fur is almost entirely replaced by slender spines. Similar spines, mixed with hairs, cover the outer surface of the limbs. Nearly half the upper surface of the tail is covered with spines, amongst which are fine hairs like those on the upper parts of the body, but more numerous; the remaining portions of the tail, being the under parts, and the whole apical half (with the exception of about two inches of naked space on the upper side) covered with stiff hairs; scanty on the terminal portion, and very dense on the under surface of the basal portion.

Colouring.—Spiny parts of the body, with the exception of the terminal part of the back, strongly pencilled with black, white, and orange-red: on the fore parts and sides of the body (the spines being in their ordinary position) the red prevails slightly over the black, and the white is but little apparent. The hinder part of the back, and the spiny portion of the tail, are pencilled with black and white. The spines, taken separately, are white at the base, black towards the point, and orange-red at the point, the white usually occupying about half of the entire length of the spine, and the remaining portion is about equally divided between the black and orange colours. The spines of the rump are white with a black point, and so are those on the basal portion of the tail, if we except a few which are tipped with orange. The muzzle is clothed with brown hairs; the moustaches are black; the fur on the under parts of the body is brownish next the skin, and ashy grey externally; the coarser intermixed hairs are black. The tail, with the exception of the spiny portion, is dusky black.

	Inches.	Lines.
Length from tip of nose to root of tail ...	13	0
" of tail	10	0
" from nose to ear	2	5
" of fore foot and nails	1	10
" of nail of middle toe		6
" of hind foot and nails	2	7
" of nail of middle toe		6½

M. Isidore Geoffroy St. Hilaire doubts that this animal is distinct from the *C. villosus*, and accounts for the absence of the plentiful long hairs, which in that animal hide the spines, by relating a statement made by an Indian to M. D'Orbigny, to the effect, that the *C. villosus* loses its hair in the summer. I can readily believe that, like many (if not all) other mammals, the *C. villosus* sheds its fur from time to time, but I cannot believe that all, or nearly all, the hairs are shed at one time; in fact, I think it may well be doubted whether the *C. villosus* ever presents the same condition as the animal under consideration. If such were the case, it is very remarkable that of all the naturalists who have observed the *C. villosus* in its native country, none have noticed the fact.

Besides the conclusions I am inclined to draw from the foregoing considerations, I am further led to doubt the specific identity of the two animals under notice, from the circumstance that the spines of the *C. spinosus* are stouter, and relatively shorter, than in *C. villosus*, and that its tail does not present the bright rufous hue on the under surface, which appears to be a constant character in the last-named animal.

CERCOLABES NOVÆ-HISPANIÆ.

Mexican Tree-Porcupine.

Hystrix Novæ-Hispaniæ.	Briss., Règne An. p. 127 (1756).
" *prehensilis*, var. γ.	Schreb., Säugth. iv. p. 604 (1792).
" "	Gmel. Linn. Syst. i. p. 119 (1788).

Hystrix Mexicana. SHAW, Gen. Zool. ii. Pt. 1, p. 8 (1801).
Cercolabes Liebmanni. REINHARDT, in Archiv für Naturgesch. 1844, Pt. 1, p. 241.
Mexican Porcupine. PENNANT, Hist. of Quadr. ii. p. 393 (1781).
Hoitztlacuatzin seu Tlacuatzin spinoso. HERNANDEZ, Rerum Medicarum Novæ-Hispaniæ, &c., p. 322 (1651).

General hue black; the spines (which are nearly all of them hidden by the fur) sulphur yellow (or, some of them, white), with the points black: tufts of spiny bristles are mixed with the fur of the under parts of the body, and are conspicuous from being, for the most part, white.

Inhabits the east coast of Mexico.

We are indebted to M. Reinhardt for a careful description of this Mexican species of Tree-Porcupine; a description founded upon two specimens procured by Prof. Liebmann, after whom the animal is named. One of these specimens was found near Mirador, about twenty-five leagues from Vera Cruz, and the other at St. Francisco, a little town but a few leagues from the same spot. The animal, however, according to Prof. Liebmann, occurs generally in the eastern portions of Mexico, from the 22d degree of N. latitude down to the 16th, inhabiting the temperate mountain regions at elevations of between two and four thousand feet above the sea. It is still known to the natives by the name of Hoitztlacuatzin, a name under which the Mexican Porcupine is noticed by Hernandez nearly two hundred years back[1].

The *Cercolabes Liebmanni* is readily distinguished from other species of Tree-Porcupines, in which the spines are hidden by a long fur, not only by its almost uniformly black

[1] There can be no doubt that this is the Porcupine described by Hernandez, and consequently that it is the *Hystrix Novæ-Hispaniæ* of Brisson, and the *H. Mexicana* of Shaw, the characters of which are derived from the account given by Hernandez; but, as the old descriptions of the Mexican Porcupine have been erroneously supposed to refer to the *H. prehensilis*, M. Reinhardt thinks it desirable to rename it.

hue, but by the under parts of its body being provided with numerous spiny bristles besides the ordinary fur. These bristles are tolerably abundant, and spring from small tubercles on the skin, each tubercle giving origin to from three to five bristles; they are about three-quarters of an inch in length, and black at the point, but being white below that part, they form a strong contrast to the dusky colour of the fur: on the throat they are very numerous, on the under side of the neck they become stouter, and towards the sides of the neck they are replaced by true spines. Spines, as usual in the animals of this section, cover the upper part of the head, the cheeks, the upper parts and sides of the body, the outer surface of the limbs, and the upper surface of the basal half of the tail. The longest spines, which are found on the back of the animal, measure about an inch and a half in length; these are moderately stout, but the spines on the extremities become more slender in proportion as the parts from which they spring are more remote from the body: those near the feet might almost be described as bristles; the spines on the cheeks are stronger than in the *C. melanurus*, and much stouter than in *C. villosus*. Most of the spines are of a pale sulphur yellow below the point, but some are white at the base; and all are black at the point. In a specimen now before me, the spines on the flanks, as well as those on the hinder part of the back, are not perfectly hidden by the fur, and those on the head are distinct, the fur being scanty on this part: elsewhere the spines are hidden by the long and soft hairs of the fur, which have the exposed ends of a sooty black hue, but are brown on the basal half. On the under parts of the body the hairs are somewhat short and scanty, and of a dusky brownish tint. Excepting on the basal half above, and a small portion at the apex, the tail is clothed with stiff black hairs.

Two specimens of the Mexican Porcupine are contained in

our London collections, and one of these, which is in the British Museum, has recently been examined by M. Reinhardt, who pronounced it to be the animal he had described. The other is in the museum of the Zoological Society, having died in the menagerie. This latter specimen agrees most closely with M. Reinhardt's description, whilst the former differs only in having the long fur of the upper parts of the body whitish next the skin, instead of brown. The dimensions are :—

	Brit. Museum. Inches.	Lines.	Zool. Society. Inches.	Lines.
Length from tip of nose to root of tail	19	6	17	0
" of tail	14	0	12	6

The length of the head and body of one of the specimens described by M. Reinhardt is 22″ 10‴, and that of the tail 12″ 5‴.

CERCOLABES MELANURUS.

Black-tailed Tree-Porcupine.

Sphiggurus melanurus. WAGNER, in Archiv für Naturgesch. for 1842, Bd. i. p. 360, ; Schreb. Säugth. Suppl. iv. p. 34.
" " GRAY, in the Annals and Magazine of Nat. Hist. for Dec. 1842, vol. x. p. 262.

General hue sooty black, pencilled with dirty white, the hairs of the fur (which are rather coarse) being sooty black, dirty white next the skin, and many of them with long pale points; spines sulphur yellow (or white), with brownish black points: tail black.

Inhabits Surinam and the northern portions of Brazil.

The specimen of *C. melanurus* originally described by Mr. Gray is 15 inches in length from the nose to the root of the tail, and its tail measures about 11½ inches. The spines of its back, as well as those on the upper portion of the basal

third of the tail, are perfectly hidden by the long dark fur, but those on the flanks are but partially concealed, and on the head there are but few hairs mixed with the spines. On this latter part the spines are white, with black points; those on the cheeks are somewhat stronger than in the *C. villosus*. On the body the spines are for the most part sulphur yellow at the root, and the brownish black at their points is but little extended. Spines are continued about half way down the outer surface of the fore legs, and of the hind legs the outer surface of the thigh only is armed; below the thigh the spines are replaced by long and coarse hairs, which are very numerous, and for the most part dirty white, but ringed with dusky below the point. The abdomen is rather scantily clothed with short, and by no means soft, hairs, which are dusky at the point, and most of them white at the root. The hairs of the moustaches are black. About one-third of the upper surface of the tail is clothed like the body, the remaining portions are covered with very stiff black hairs, and these are dense, except on the tip of the organ. The feet are covered with short and coarse black hairs, excepting on the upper surface of the tarsus, where they assume a dusky brown tint. The hairs on the back average about 2½ inches in length, but many are considerably longer: the greater portion of the hairs are fine and soft, but mixed with these are numerous longer and somewhat coarse hairs; the finer hairs are for the most part black, excepting at the base, where they are dirty white; whilst the longer hairs are some of them entirely dirty white, and others differing from these in having the middle portion dusky: the spines on the same part are very many of them about 13 lines in length, and the longest are scarcely 1¼ inches.

In this specimen the long hairs on the body are of a dirty greyish white colour at the point, and such is the case in a specimen in the Leyden Museum; but three specimens

examined by Dr. Wagner are described as having the hairs of a delicate yellow at the point.

The *C. melanurus* may be distinguished from the *C. villosus*, *C. affinis*, and *C. nigricans*, by its tail being uniformly black, except on the basal portion of the upper surface, where it is clothed with spines and bicoloured hairs like the body. The stiff black hairs which cover other parts of the tail (if we except about two and a half inches of the apical portion) are very abundant—decidedly more dense than in the *C. villosus*; its fur is coarser than in the last-mentioned animal, and none of its spines are terminated by an orange-coloured point as in that species; its tail, moreover, is decidedly longer.

The dimensions of the specimens referred to by Dr. Wagner, which are in the Vienna Museum, are—

	No. 1.		No. 2.		No. 3.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
From tip of nose to root of tail	17	8	15	6	15	4
Length of the tail	16	0	17	6	15	0

The specimen in the Leyden Museum is 13½ inches in length, without including the tail, which is 11½ inches. It is from Surinam, whilst two of the specimens (Nos. 2 and 3) in the Vienna Museum, were procured by Dr. Natterer at the Barra do Rio Negro. Possibly this species does not extend south of the Amazon.

CERCOLABES VILLOSUS.

Tri-coloured Tree-Porcupine.

(*Plate* 21, fig. 2).

Sphiggurus villosus. F. Cuvier, Mém. du Mus. ix. p. 434 (1822); Dict. des Sci. Nat. xlii. p. 534 (1826).
" " Lesson, Manuel de Mammalogie, p. 292 (1827).

Sphiggurus villosus.	Is. Geoff., Dict. Class. de l'Hist. Nat. xiv. p. 216, (1828).
Cercolabes insidiosus.	Brandt, Mamm. Exot. p. 71, Pl. 4 (animal); and Pl. 10, figs. 5—7 (skull). 1835.
" "	Wagner, Schreb. Säugth. Suppl. iv. p. 31, Pl. 148 a, (1844).
Sphiggurus variegatus.	Gray, in the Brit. Mus. collection.
? *Hystrix insidiosa.*	(Licht.) Kuhl, Beitr. z. Zool. p. 71 (1820).
? " "	Pr. Maximil., Beitr. z. Nat. ii. p. 434 (1826); Fig. in Abhandl. zur Naturg.
? *Sphiggurus spinosus.*	Rengger, Nat. der Säugth. von Paraguay, p. 240, (1830).
? *Hystrix Couiy.*	Desm., Mammalogie, Pt. 2. p. 345 (1822).
? *Le Couiy.*	Azara, Essais sur l'Hist. Nat. de Paraguay, ii. p. 105 (1801).

Spines of the head and upper surface of the basal portion of the tail, as well as those of the body, tri-coloured, viz. white, or pale sulphur yellow on the basal half, orange-coloured at the point, and ringed with black below the point; spines on the rump yellow-white at the base, and black at the point: fur very long, for the most part hiding the spines, and of a brown-black colour, but each hair with a long pale point—usually pale yellow—or rufous-brown: tail rusty yellow, or rust coloured, beneath at the base.

Inhabits Brazil.

Of this species I have examined six specimens,—two in the Paris Museum, labelled as the *S. villosus* of F. Cuvier, two in the Leyden, and two in the British Museum. All these specimens agree in having most of the spines (with the exception of those on the hinder part of the back) of a sulphur yellow colour, or white, at the root, black or dusky above the middle, and orange coloured at the point; the orange colour being more or less bright, and sometimes with a slight admixture of brown. The spines on the hinder part of the back differ from those of other parts in wanting the orange point; they are sulphur yellow, or white, with a black point[1].

[1] See *a*, in fig. 2 of Pl. 21; *b* and *c* represent spines from the back of the animal; spine *a* is from the hinder part of the back.

Here and there, mixed with the orange-pointed spines, may be seen shorter spines, in which the point is dusky. In young individuals the colouring of the spines is less intense; the black is replaced by dusky or brown, and the orange colour at the point is very pale—sometimes replaced by dirty yellow. Those spines which are most completely hidden by the fur have the sulphur yellow most distinct, whilst in those which are exposed, such as the spines of the head, this colour is replaced by white, or is only seen near the root of the spines. The long fur with which the animal is clothed is dusky black, or brownish black, but each hair is terminated by a long pale point, which is sometimes of an extremely pale brown-grey hue, sometimes yellowish, sometimes tinted with rufous, and always glossy. On the back, those hairs are from $3\frac{1}{2}$ to 4 inches in length: on the head they are scanty, and by no means hide the spines, whilst on other parts they are so dense that the spines are nearly all of them hidden by the fur. Occasionally specimens are seen in which the fur is less dense on the flanks and hinder part of the back, in which parts the spines consequently show themselves. The spines occur on the upper surface of the head, on the cheeks, the whole upper parts of the animal, as well as on the flanks, the outer surface of the upper half of the limbs, and the upper surface of the basal half (or rather less) of the tail. The longest spines (which are found on the hinder part of the crown of the head, and on the back) average about 2 inches in length, and have a diameter of $\frac{1}{34}$th of an inch. The under parts of the head and body, and the inner surface of the limbs, are clothed with shortish hairs of a dusky hue, but with pale points. The coarser hairs which cover the lower half of the limbs externally, and the feet, are similarly coloured. The lower surface of the basal half of the tail is densely covered with stiff bristly hairs, the visible ends of which are rusty yellow, or bright rust coloured, but the hidden

portions are black; the terminal half of the tail is clothed with less stiff hairs, which become gradually more scanty towards the point, and are not sufficiently numerous to hide the scaly skin; they are black near the middle of the tail, and brown at the end: from two to three inches of the apical portion of the tail, above, is almost destitute of hairs.

	Paris Museum.		Paris Museum.		British Museum.		Leyden Museum.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Length from tip of nose to root of tail	13	0	15	6	18	0	18	0
" of tail	11	6	9	9	13	6	10	0
" of fore foot and nails ...	1	7	1	10	1	10		
" of nail of middle toe ...		6		6		7		
" of hind foot and nails ...	2	5	2	8	2	8		
" of nail of middle toe of ditto		6		7		7½		

The animal above described is, I think, without doubt identical with the *S. insidiosus* of Brandt, and of Wagner. It has been identified with the Paraguay Tree-Porcupine, but the following particulars, gleaned from Dr. Rengger's description of that animal, indicate differences which leave some doubt as to the accuracy of that identification.

Sphiggurus spinosus. Rengger.
Hystrix Couiy. Desm.
Le Couiy. Azara.

According to Rengger, this Paraguay animal is 22 inches in total length, of which the tail measures 9½ inches. Its spines are for the most part of a sulphur yellow on the lower half of their length, and chestnut brown at the apical half; some are yellow, with the point, only, brown; others, again, are yellow at the base and point, and brown towards the middle; whilst the spines on the forehead differ from the last-mentioned in being reddish yellow at the point. The spines on the neck and back are almost entirely hidden by hairs which

are more than two inches in length, of a greyish brown colour, but with yellow-red, or reddish yellow, points. The spines are said to vary from 6 to 16 lines in length, and they occur in the same parts as I have noticed in the *H. villosus*.

Hystrix insidiosa. Pr. Maximilian.

This is also supposed, by most authors, to be the same species as the *S. villosus* of F. Cuvier, and my only reason for placing a note of doubt to the *Hystr. insidiosa* of Prince Maximilian, where that name occurs amongst the probable synonyms of F. Cuvier's species, is, that the Prince describes the spines of his animal as having brown-black points; the only exception noticed being in the spines on the head, which, as in *S. villosus*, have yellowish red points. The long hairs of the fur of the back are said to be of a grey-brown colour, but with bright red points. In having the tail yellow-red beneath, and, indeed, in all other respects, the description of Pr. Maximilian agrees with the *S. villosus*.

Hystrix insidiosa. (Licht.) Kuhl.

The original description of the *Hystrix insidiosa* of Lichtenstein is that given by Kuhl in his *Beiträge*. All we learn respecting the animal from this, or, I believe, from any other source, is, that it is a long-tailed Porcupine, and that the upper parts of its body are covered with hairs and spines, in contradistinction to the *H. prehensilis*, in which these parts are covered with spines only—in fact, that it belongs to the section *Spingurus*. Then for specific characters Kuhl informs us that it is of the size of the *Arctomys Marmota;* its spines less than an inch in length, very sharp at the point, *of a straw colour at the base, and brown at the apex:* that they are most plentiful on the basal portion of the tail, on the neck, and above the eyes; that long and soft hairs,

of a pale ashy grey colour, extend beyond the spines, and that the tail is clothed with bristly hairs.

Amongst the numerous specimens which Dr. Wagner informs us he has examined, of the animal which he describes under the name *insidiosus*, none are noticed as having the spines bi-coloured (as wanting the orange colour at the point), or as having the fur of a pale ashy grey colour. Neither does M. Brandt notice such characters in the two specimens he describes under the same name. On the contrary, the specimens examined by these authors have the dark fur and tri-coloured spines, as in the six specimens noticed by myself, and described under the head *C. villosus*; and hence I think it highly probable Kuhl's animal is a distinct species from the *C. villosus*.

Cercolabes nigricans. Brandt.

Cercolabes nigricans. Brandt, Mamm. Exot. p. 67, Pl. 3 (animal), and Pl. 10, figs. 2 and 3 (skull).

Spines but imperfectly concealed by the fur, for the most part of a pale sulphur yellow, or white colour, with a subterminal dusky or black ring, and a dirty orange-coloured point; the spines on the rump, and many of those on the tail, white, with a black point. Hairs of the fur black, or dusky, with the points yellowish brown, or yellowish. Tail with black or brown hairs (excepting on the upper surface of basal portion, where there are spines and hairs), on the apical portion, and with those on the under surface of the basal half, black, with the points of a palish brown-straw colour. Nasal bones rather larger than in *C. villosus*. From nose to root of tail 14¼ inches; tail, 9 inches.

I see no points in M. Brandt's detailed description of his *C. nigricans* which appear to me to indicate that that animal differs specifically from the *C. villosus*. The species is

founded upon a single specimen procured by Langsdorff in Brazil, and shot, as I suspect, whilst it was shedding its fur.

Cercolabes affinis.

Cercolabes affinis. BRANDT, Mamm. Exot. p. 76, Pl. 5 (animal), and Pl. 10, figs. 8 and 9 (skull).

Brown, inclining to yellowish grey; abdomen and extremities pale greyish brown; tail, on the under side of basal portion, with a mixture of brown and yellowish colours: spines on the forehead of a pale dirty orange colour at the point, those on the back for the most part brown or dusky at the point, the remaining portion being white, or tinted with yellow.

Inhabits Brazil.

The hairs of this animal are said to be rather less rigid, and its spines stronger than in the *C. insidiosus*. There are, moreover, but few of the spines on the back which are tinted with orange colour at the point, most of them being dusky or brownish at that part. The spines on the arms, as well as those on the rump, are but little hidden by the fur. The fur of the upper parts, which is less dense than in *C. insidiosus*, is of a somewhat hoary blackish brown hue, with the points of the hairs greyish yellow. The stiff hairs on the under surface of the basal portion of the tail are brown-black, with yellowish points; sometimes brown-yellow immediately below the point.

	Inches.	Lines.
Length from nose to root of tail	13	0
" of tail	10	6

But one specimen is noticed as presenting the above characters. The upper surface of its skull is more flat than in the animals described as *C. insidiosus* by Brandt (*C. villosus* of F. Cuvier), the incisive foramen narrower; and some other distinctions are noticed, which are certainly

by no means important. According to the figures given by Brandt, the most striking difference is observable in the form of the zygomatic arch, the malar bone being considerably narrower behind than in *C. nigricans* and *C. insidiosus*, and having an obtuse post-orbital process, which is placed more forward than the less distinct corresponding angle noticed in the malar bone of the two animals last named. I am by no means satisfied that the *C. affinis* is distinct from the *C. villosus*.

Cercolabes pallidus.

General hue of an extremely pale fulvous brown; spines pale sulphur yellow, or white, with a short black point, and almost entirely hidden by the long fur; muzzle dusky brown; feet suffused with brown; tail brown-black beneath.

The fur of the animal is soft, has a silk-like gloss, and is remarkable for its pale colour; the hairs are almost uniform in tint from the root to the point, and that tint may be described as pale fulvous, or rufous-yellow, with a slight admixture of brown; the limbs, lower parts of the flanks, and the under parts of the body, are of a more decided brown hue, and the feet and muzzle are suffused with dusky brown. The spines on the upper surface of the head, and on the cheeks, are short, and almost pure white, with short black points, and those on other parts of the body differ only in having a sulphur yellow colour at the root, which is more or less distinct—very evident on the spines of the back, and scarcely to be traced on those covering the rump, and on many of those on the tail. The longest hairs on the back measure about an inch and a half in length. The limbs (excepting quite at the base externally), and the whole of the under parts of the animal, are destitute of spines, but on the outer surface of the legs (especially of the fore legs) there are

numerous spiny hairs, mixed with the soft hairs of the ordinary fur, and which are coloured like the true spines. The hairs of the moustaches are black, and there are a few long, stiff, black hairs, springing from the limbs. The tail is short: on the upper surface of the basal half it is clothed with spines and long fine hairs, like those on the body, but the spines are very slender, and towards the sides of the tail they are replaced by bristly hairs, which are white, but have a longish black point. The remaining portions of the tail are clothed with coarse and somewhat short hairs, with the exception of the apical portion above, which is naked; the naked space extending about two inches from the point. The hairs of the tail are nearly all of them of a brownish black colour, the only exceptions being those which spring from the terminal portion of the organ, which are brown.

	Inches.	Lines.
Length from tip of nose to root of tail ...	12	6
" of tail, about	7	6
" of hind foot and nails	2	1

In the British Museum are two specimens of this pale-coloured Tree-Porcupine, one of which is said to be from the West Indies; they are both immature animals, the largest (of which the dimensions are given) having but three molars on each side of the jaw. Possibly this may be the *H. insidiosa* of Lichtenstein, but I think that Kuhl, who described that animal, would scarcely have omitted to notice the black hue of the under surface of the tail, which forms a strong contrast with the pale tint of other parts. The tail in this animal is decidedly shorter than in the *C. melanurus*.

Fossil *Cercolabina*.

Synetheres magna et *dubia*. LUND.

Dr. Lund has found the remains of two species of Tree-Porcupines in the caverns of Brazil, which he regards as

distinct from the recent species; one of them, to which he gives the specific name *magna*, is supposed to have been as large as the Peccari.

Cercolabes fossilis.

Remains of a species of Cercolabes, or of an animal of a closely allied genus, contained in the British Museum, indicate the former existence of a very large species of this group, but a species which, however, must have been inferior in bulk to the *C. magna* of Lund. These remains consist of portions of the right and left branches of the lower jaw, one ramus containing two molar teeth, and the other, three; and this latter, moreover, shows the socket of a fourth molar. The three molars *in situ* are the three hindermost, and these measure together 11 lines in the longitudinal direction. Judging of the size of the anterior molar by its socket, the four molars must have measured, together, full fifteen lines, whilst in the *Cercolabes prehensilis* the four corresponding teeth measure but 10½ lines. The transverse diameter of one of the molars in the fossil jaw is fully 3½ lines: the depth of the jaw, below the penultimate molar, is 7½ lines. In the structure of the teeth there is no difference between the fossil and the recent species. The specimens referred to are from the caves of Minas Geraes, in Brazil.

Genus, *Erethizon*[1].

Erethizon. **F. Cuvier, Mém. du Mus. ix. pp. 426 and 432.**
Hystrix. **Linn.**

Tail short, thick, and depressed, covered above, at the base, with hairs and spines; at the apex, and on the under surface,

[1] From ἐρεθίζω, to irritate.

with stiff bristles; nostrils closely approximated; feet short and broad; toes 4—5, all armed with long and curved claws.

Inhabit North America, between the 37th and 67th parallels of latitude.

In the genus Erethizon the skull and dentition are essentially the same as in the Cercolabes group, and, indeed, the Canada Porcupine, the only known representative of this group, clearly is a mere modification of that South American type, the main differences being, that in the North American Porcupine the tail is shorter (being about equal to one-third of the length of the animal), much stouter, and somewhat depressed: this organ, moreover, wants the prehensile power which is found in the tail of the South American species, and is well covered throughout either by hairs or spines. The nostril-openings are more approximated, being separated—at their lower part especially—by an extremely narrow partition.

The hind feet present a well-marked difference, in being provided with a distinct inner toe, and that armed with a large claw, which is but little inferior in size to the claws of the other toes; these feet, moreover, want the projecting semicircular lobe on the inner side. All the claws are large, much arched, and but little compressed. The naked soles of the feet, as in *Cercolabes*, are covered by minute tubercles. The upper lip is slightly notched above the incisor teeth, but there is no dividing groove—no naked mesial line—such as we shall have to notice in describing the Old World Porcupines; even the narrow septum between the nostrils is not destitute of hairs. The body is stout, and covered on the upper parts with a long and dense fur, which hides the spines. The limbs are short and strong.

ERETHIZON DORSATUS.

Canada Porcupine.

Hystrix dorsata.	LINN., Syst. Nat. 12 ed. p. 76.
" "	SCHREB., iv. p. 605, Tab. 169.
" "	DESM., Mamm. Pt. 2, p. 345.
" "	SABINE, Franklin's Journal, p. 664.
" "	COZZENS, in Annals of the Lyceum of Nat. Hist. of New York, i. Pt. 1, p. 190.
" "	HARLAN, Fauna Amer. p. 190.
" "	AUDUBON and BACHM., Quadr. of N. Amer. i. p. 277.
Hystrix pilosus, Americanus.	CATESBY, Carol. App. p. 30.
" *Hudsonius.*	BRISSON, Règn. Anim. p. 182.
" *pilosus.*	RICHARDS., Fauna Boreali Americana, p. 214.
Erethizon dorsatum.	F. CUVIER, Mém. du Mus. ix. p. 432, Tab. 20.
" "	BRANDT, Mamm. Exot. p. 51.
" "	WAGN. Schreb. Säugth. Supp. iv. p. 27.
Canada Porcupine.	FORSTER, Phil. Trans. lxii. p. 374.
" "	PENNANT, Quadr. ii. p. 126; Arct. Zool. i. p. 109.
L'Urson.	BUFFON, Hist. Nat. xii. p. 426, Tab. 55.

Fur dark brown, the large and coarse hairs usually with long dirty white points; spines white, with the point dusky, or brown; stiff hairs on the under surface of the tail, dusky, or brown.

The Canada Porcupine is about two feet in length, has short legs and tail, and a stout body; the stout appearance of the body, however, in a great measure arises from the long and dense fur with which it is clothed. The fur is composed of hairs of two kinds; one, which is much more plentiful than the other, is of a soft and somewhat woolly nature; this is long; but the other kind of hair, which is coarse, and almost bristly in parts, is very long, measuring often six or seven inches in length on the back of the animal. The shorter hairs are sometimes brown, sometimes dark brown,

and I have seen specimens in which it was almost black, but in all cases it is greyish next the skin. The longer hairs are also dark, but they usually terminate in long dirty white points; and, being tolerably abundant, these pale points give to the general hue as light greyish tint. In some specimens which have come under my notice, the long hairs were most of them of an uniform dark hue; those near the head, and on the hinder part of the back, only, having pale points. The spines, which are hidden by the long fur, are found on the whole of the upper parts of the animal in great abundance; commencing on the crown of the head; they extend downwards towards the cheeks, behind the eyes, and they cover likewise the sides of the body, and part of the outer surface of the hind legs, as well as the upper surface of the tail. Those on the head and fore parts of the body are slender; on the middle of the back they are about two and half inches in length, and about $\frac{1}{24}$th of an inch in diameter. On the hinder part of the back they are stouter, many of them one line in diameter. All the spines are white at the base, and nearly all of them are dark at the point; on the fore parts of the body they have the terminal half (or often less) brown —frequently yellow-brown—especially in the spines which spring from the region of the shoulders: on the hinder part of the back they are dusky or black at the point. In many of the spines of this part the dark hue is considerably extended, but in some it is confined to the extreme point. The muzzle is clothed with short hairs, if we except the usual long bristly hairs which spring from the sides, and which are here black. On the cheeks there is an admixture of spiny hairs. The fur on the under parts of the body is rather short; brown, without any admixture of white. On the limbs there is usually an abundance of coarse, white-pointed hairs, especially on the hinder and outer part of the hind legs. The feet are clothed for the most part with long and coarse dark

hairs. The tail is covered on the upper surface, at the base, with spines and hairs like those on the body; on the sides with long and bristly dirty white hairs, and the under surface is densely covered with stiff bristles, which are short near the root of the organ, but gradually increase in length towards the opposite extremity; often these bristles are black, but sometimes they are brown. The ears are well clothed with dark hairs, and are hidden by the long fur of the surrounding parts.

Usually the spines on the head are but imperfectly hidden by the fur, and generally the spines on the hinder part of the back are but partially concealed, the fur being comparatively scanty at this part.

A specimen which lived for some time in the Gardens of the Zoological Society, and which is now in that Society's Museum, lost nearly all the fur from the spiny parts of the body.

A young Canada Porcupine in the British Museum differs from others which have come under my notice, in having the muzzle, the under parts of the body, inner surface of the limbs, and the feet, rufous-brown, the other parts being brown-black: a few white pointed hairs are seen near the head and on the hinder part of the back.

The specimens contained in the British Museum, and in the museum of the Zoological Society, vary from thirteen to twenty-five inches in length, without including the tail, which is equal to about one-third of the length of the head and body. I subjoin the dimensions of the Canada Porcupine given by Dr. Richardson and Dr. Bachman.

	From Dr. B.		From Dr. R.	
	Inches.	Lines.	Inches.	Lines.
Length of head and body	29	0	30	0
" of tail (vertebræ)	7	0	8	0
" of ditto to end of hair ...	8	6		
From heel to longest nail	3	6		

According to Dr. Richardson, the Canada Porcupine has been met with on the banks of the Mackenzie as far north as lat. 67°. Dr. Bachman informs us that the animal is rare in the northern and eastern parts of the United States; but is found, however, in the northern and western parts of New York, and is said to be increasing in numbers in some of the western counties of that state. Dr. Leonard obtained specimens from the mountains of Vermont. It occurs sparingly in the northern parts of Pennsylvania, and in a few localities in Ohio; and specimens have been obtained by Messrs. Audubon and Bachman from the Upper Missouri.

The Canada Porcupine climbs trees with facility, but, whether on a tree or upon the ground, it is slow in its movements. Although from this circumstance it cannot escape from its enemies by flight, it is not attacked with impunity. It is stated by Messrs. Audubon and Bachman, that a Canada Lynx was found in the woods in a dying state, owing to its mouth being filled with the quills of this Porcupine, and that they have heard of many Dogs, some Wolves, and at least one Panther, which had been found dead in consequence of the inflammation produced by these quills. The quills are loosely attached to the skin of the animal, and being barbed at the point, they readily fix themselves to whatever they penetrate, and if not removed, they, by the slightest motion, become more and more deeply inserted.

Dr. Bachman, who kept one of these animals in confinement for some time, relates, that upon one occasion it made its escape into his garden, and when there, was attacked by a large mastiff belonging to a neighbour. At the moment of attack, the Porcupine, by raising its spines and long fur, appeared suddenly to have become twice its usual bulk: it gave the dog a lash with its tail, by a sharp lateral movement of that organ; the dog immediately retracted, and commenced howling; its nose, mouth, and tongue, so beset with

the Porcupine's spines, that it could not close its jaws. These spines were immediately extracted, but the dog's head was very much swollen for some weeks afterwards, and it was two months before it fully recovered.

The food of the Canada Porcupine consists of various vegetable substances, and, in the winter months, this animal subsists chiefly, if not entirely, upon the bark of various kinds of trees. *According to several accounts, a single* Porcupine will, by stripping them of their bark, kill an immense number of trees in the course of the winter. It seldom quits a tree until all the bark is eaten, and hence remains in the same tree for a long time—sometimes for a week ; at the end of which time it will most probably commence its attack upon a second tree near the first. This fact is so well known, that a person desirous of obtaining one of these animals which he may have seen in a certain spot, will return to that spot after a considerable lapse of time with the expectation of finding the animal not far distant. As the animal is usually found on the branches, it is often necessary to cut down the trees to procure it: when approached, it is said to make a crying noise, like that of a child. The female Porcupine brings forth generally two young at a birth ; but three, and even four young, have been found in the nest: this is placed in the hollow of a tree.

Erethizon epixanthus.

Erethizon epixanthus. Brandt, Mamm. Exot. p. 55, Pl. 1 (animal); and Pl. 9, figs. 1—3 (skull).

Fur brown or brown-black, whitish next the skin ; the longer and coarser hairs brownish yellow at the point : spines white, or yellowish at the base, and most of them brown-black, or dusky at the apex.

Inhabits the west coast of North America—California, Unalaschka, and Sitka.

Five specimens of an Erethizon from the west coast of North America, in the museum at St. Petersburgh, having the exposed ends of the longer hairs of the fur of a brownish yellow colour instead of white, as the same hairs are stated to be in the *E. dorsatus*, M. Brandt is inclined to suppose there are two species of *Erethizon*, but not having specimens of the Canada animal for comparison, he is not able to satisfy himself upon this point. The specimens examined by M. Brandt are from California and Unalaschka, and I may add that a similar animal is found at Sitka, a specimen from that part, which I saw in the Leyden Museum, agreeing with M. Brandt's description: its spines were, most of them, of a delicate yellow below the dark points.

PHILOGÆÆ, Brandt; or HYSTRICINA proper.

The more I examine the members of the Porcupine group, the more satisfied I am of the distinctness of the sections into which they have been subdivided: in fact, that we should follow Brandt in regarding these sections as sub-families: and I think it would be well to confine the name *Hystricina* to the Old World species, and (following the ordinary practice of taking the sub-family names from the typical genus of the sub-family) to adopt Mr. Gray's name, *Cercolabina*, for the New World section.

The principal distinctions of these two sections have already been noticed, and I have only to add, that the true *Hystricina* are further distinguished from the *Cercolabina*, by the upper lip being divided by a vertical groove which runs up to join a transverse fissure which unites the nostril-openings, as seen in fig. 7 of Plate 6 *a*[1].

[1] The difference will be seen upon comparing this figure with the fig. 6 *a*, on the same plate, which represents the terminal portion of the muzzle in one of the *Cercolabina*. Ordinarily, in the Common Porcupine and its allies, we

M. F. Cuvier divides the Old World Porcupines into two genera,—*Hystrix*, and *Acanthion*[1]; the former genus having for type the Italian Porcupine, and the latter being founded upon the *H. Javanica*. The genus *Acanthion* is not adopted by the Baron Cuvier, but in his second edition of the *Règne Animal* we find the sectional name *Atherura* (les *Atherures*) proposed for the long-tailed species named *Hystrix fasciculata* by Linnæus. Mr. Gray, in a paper upon these animals recently communicated to the Zoological Society[2], adopts the three divisions formed by the Cuviers, and adds a fourth sectional name to the Old World Porcupines, separating the *Histrix Javanica* (but only as a sub-genus) from other species of the genus *Acanthion*, and applying to this section the name *Acantherium*.

Setting aside the section *Atherura*, which I adopt, I must remark, with respect to the species included in the remaining three sub-divisions, that one of them—the *Histrix cristata* of Schreber—is pre-eminently distinguished amongst Rodents by the enormous size of the nasal cavity of its skull; and, as this cavity is enclosed above by the nasal bones, these bones are proportionately large; whilst the other species show a gradual decrease in the size of the cavity in question, and consequently of the nasal bones. This will be seen upon referring to Plate 20[3], in which the skulls of the animals under consideration are represented. It will further

perceive but a narrow vertical fissure in the upper lip, and a curved groove, marking the termination of the nose, but these grooves are formed by folds of the integument, which the animal has the power of separating to a certain extent (as represented in fig. 7), and it is only when thus separated that we can see the boundaries of the nostril-opening. The skin in these folds is hairless.

[1] Mémoires du Muséum, ix. p. 424.

[2] Proceedings for June, 1847; and Annals and Magazine of Natural History for November, 1847, vol. xx. p. 349.

[3] The nasal bones are marked *n* on the figures, which were drawn by myself assisted with the camera lucida (as are the greater portion of the skulls figured in this work), and are reduced to half the natural size.

be observed, upon inspecting this plate, that the intermaxillary bones (*int. m.* on the figures) vary considerably in form in the different crania, and especially in being more or less broad, or more or less contracted at their hinder extremity; and, lastly, it will be seen that there are considerable differences in the relative size of the parietal bones (*p.*) Of these skulls M. F. Cuvier was acquainted only with the two marked figs. 1 and 4 on the Plate. Fig. 1 exhibits the characters of the genus *Hystrix* according to this author, and fig. 2 those of his genus *Acanthion*, which he distinguishes as having the cranium less arched, the nasal bones much smaller, and the parietal bones more extended, as compared with fig. 1. Mr. Gray, giving most importance to the form of the intermaxillary bone, arranges together under the sectional name *Acanthion*, the species in which that bone is contracted behind, including the animals of which the crania are represented by figs. 1, 3, and 4, on Pl. 20; and places in the genus *Hystrix*, the *H. leucurus* (skull, fig. 2), distinguishing this genus by the intermaxillaries being truncated behind, and as broad at that part as in front. The two sub-divisions of the genus *Acanthion* are thus characterized—

* "The nasal very long, broad to the middle of the orbit"—ACANTHION proper.

** "Skull narrower in front. Nasal bone moderate to the front edge of the orbits. Malar bone with an obtuse post-orbital process"—ACANTHERIUM.

For further details respecting Mr. Gray's views upon the subdivisions of the Old World Porcupines, I must refer the reader to the paper already quoted. Mr. Gray notices a difference in the form of the molars, and certain differences in the form of the quills or spines, together with the absence or presence of a crest on the back of the neck, as helping to distinguish the genera *Acanthion* and *Hystrix*; but these differences do not exist in all cases, since Mr. Gray's *Hystrix*

leucurus, and his *Acanthion Cuvieri*, do not present such points of distinction.

With respect to the distinctions derived from the structure of the cranium, I cannot but regard them as simply specific. Viewing them with reference to M. F. Cuvier's definition, we find the skulls, figs. 2 and 3, presenting intermediate conditions; and, in adopting Mr. Gray's views, we must associate animals which, although they agree in having the hinder portion of the intermaxillary bone contracted, present the greatest extremes in other cranial characters, and which, in fact, present the types of the two divisions previously founded by M. F. Cuvier. Thus—

Gen.—ACANTHION, *Gray*, is = HYSTRIX, and ACANTHION, *F. Cuvier*.
Sub-gen.—ACANTHERIUM, *Gray*, is = ACANTHION, *F. Cuvier*.
Gen.—HYSTRIX, *Gray*, is founded upon an animal unknown to *F. Cuvier*.

Genus, *Hystrix*.

Hystrix. LINN., Syst. Nat. 12 ed. p. 76.

Hystricina with a short tail: the hinder part of the back armed with long cylindrical spines or quills.

Geogr. range: the southern portions of Europe, the middle and southern portions of Asia, and perhaps the whole of Africa.

The molar teeth in the species of *Hystrix* (Pl. 20, fig. 2 *b*) are arranged in parallel series, and their crowns are of an oval or round form; they are deeply implanted in the jaws, and divide at the base into very short roots, in most of them three in number. Each upper molar has a strongly indenting fold of enamel on the inner side, and when moderately worn, the crown presents three or four areas surrounded by enamel; the hindermost is very small and nearly round; the remaining three are narrow, placed transversely, and more or less curved, having the convex side of the curve directed to the front of

the tooth: of these three, the hindermost is the longest and most curved; they all entered originally from the outer side of the tooth. In a much worn molar the inner fold becomes isolated from the inner side of the tooth, and the crown then presents five narrow areas surrounded by enamel. When but little worn, the internal enamel-fold is united with a fold from the outer side, so as to form a separate lobe of the anterior portion of the tooth, as in the uppermost of the four teeth figured[1]. The lower molars resemble the upper, excepting that the corresponding enamel-folds are reversed in position. The incisor teeth are moderately large, rather deeper than broad, and nearly flat in front; the upper and lower pairs are of equal width.

Both fore and hind feet are provided with five toes, but the inner toe of the fore foot is extremely short, and armed with a small blunt nail; the remaining toes have strong and moderately curved claws. The soles of the feet are naked and smooth beneath; there are three large fleshy pads at the base of the toes of the fore foot, and two others (wrist pads) behind these. On the sole of the hind foot there are four pads at the base of the toes, and two on the hinder half of the foot, one of which (on the outer side of the sole) is very long, extending from the middle of the sole to the heel.

I am acquainted with four well-marked species of Hystrix, two of which have a crest composed of very long bristles, and springing from the crown of the head and from the back of the neck; the remaining two have no crest.

Sect. 1. *Head and back of neck with a crest of long bristles.*

[1] The upper tooth in the figure 2 *b*, is the front upper molar, and is the last tooth in the jaw which is developed, its place being occupied until a late period by a deciduous molar, which, when present, is easily distinguished by its comparatively long and distinct roots: these may be seen without removing the tooth from the socket.

length, being the terminal portion, entirely white: bristles of the crest most of them dusky, with long white points, and some of them entirely dirty white.

Skull (Pl. 20, figs. 1 and 1 *a*) with the upper surface strongly arched, the nasal bones enormously large, terminating posteriorly nearly in a line with the posterior root of the zygoma; together, their outline approaches to an oval form; intermaxillary bones very broad in front, and much contracted behind, where they are about half as wide as in front.

Inhabits Italy and the northern and western portions of Africa.

The following description is taken from a specimen recently added to the British Museum collection, and which is from the Gambia. Its skull[1], which has been removed from the skin, although of very large size, does not display the fully adult condition of the teeth, the last molar in each series being but imperfectly developed.

The length of the animal, measured in a straight line from the tip of the nose to the root of the tail, is 28 inches. Its large and obtuse muzzle is but sparingly clothed with small hairs, and these of a dusky hue; on the upper lip, are numerous scattered, longer, and coarser hairs. The fore parts of the animal, as well as the limbs and under parts, are covered by spines, mingled with which—more especially on the under parts of the body—are some coarse hairs. The spines on the shoulders are most of them rather less than two inches in length; they are inserted into the skin by a slender stalk, above which they rather rapidly increase in size, so as to attain their greatest diameter at about the termination of the basal third of their length; from this part they become gradually narrower towards the point, but at a short distance from the point they are more suddenly contracted, so that the point itself (for the length of about two lines) is very slender, and somewhat flexible. The surface of these spines presents

[1] It is the skull of this specimen which I have figured in Plate 20, fig. 1.

several delicate longitudinal channels, and when cut transversely, their section approaches to a square figure, but is rather broader than deep. Excepting some slight variations in size, this description will apply tolerably well to all the spines found on different parts of the animal.

The crest is composed of immensely long bristles, very stout at the base, but tapering somewhat towards the opposite extremity; they are very abundant, and curved gently backwards: the crest commences on the crown of the head, extends along the back of the neck, and for a short distance on the back. Many of the bristles are as much as sixteen inches in length. The whole of the hinder half of the body (if we except the under parts), as well as the tail, is covered by quills. Of the quills there are three principal varieties: one kind is distinguished by their great length (from 12 to 16 inches), being comparatively slender, somewhat flexible, and varying scarcely in diameter for the greater portion of their length. These are most forward in position, and, excepting when erected, they almost entirely hide the next kind of quills to be noticed. This second kind of quills is much stouter and shorter than the first; they taper from near the base to the point, which is very sharp, and they are very stiff; the longest of these are about 6 inches in length, and 3 lines in diameter, at the thickest part. They cover the hinder third of the back, and the basal portion of the tail, but along the mesial line of the rump, it must be observed that, though the spines are stiff, and sharply pointed, they are much smaller than on other parts. Besides the stout quills in the region of the tail, there are a few very long and slender quills in these parts. The third kind of quill is very unlike the other two varieties; they spring from the tip of the tail, are hollow, most of them open and truncated at the end, and each one is supported upon a very slender stalk, usually about half an inch in length; their average diameter is about a

quarter of an inch, and most of them present an oval section; some are pointed, and no doubt all are so at first. Usually they are about twenty in number. The feet are covered with very long and coarse hairs. The bristles springing from the sides of the muzzle are very long, being many of them seven or eight inches in length.

The prevailing colour of the animal is brown-black; a white band crosses the fore part of the neck, and extends about half way up the sides, becoming gradually narrower from the middle. The stout bristles forming the crest are brownish, but have very long white points; some of them are entirely white: the spines covering the shoulders, and most other parts of the animal not protected by the quills, are grey-brown at the base, and dusky or brown-black at the point: the feet are nearly pure black. The quills are most of them broadly annulated with black and white—white at the root and point. The long and slender quills, which cover the stouter kind, have moderately long white points. The quills on the rump—more especially in the mesial line—are chiefly black; those at the end of the tail, as well as nearly all the other quills springing from this organ, are entirely white; some few of the quills near the root of the tail are partly black and partly white.

	Inches.	Lines.	Inches.	Lines.
From tip of nose to root of tail ...	28	0	26	0
From ditto to ear	5	0	5	6
Height of free upper portion of ear		9		10
Total height of ear	1	8	1	10
Length of fore foot and nails ...	3	2	3	4
" of the longest nail		8		
" of hind foot and nails ...	4	3	4	2
" of longest nail		8		
" of tail, not including the quills	6	0		
" of one of the hollow quills at	2	6		
the end of ditto ...			2	6
" of which the slender stalk is		9		6
Diameter of the expanded hollow portion		3		5

The dimensions in the second column are from a specimen in the museum of the Zoological Society, and which is from Tunis: it differs from the Gambia specimen, in having most of the short quills on the mesial line of the rump, near the root of the tail, entirely white; and in having the hollow quills at the end of the tail much broader.

The leading peculiarities of the skull of the Common Porcupine have already been noticed: it is readily distinguished from the crania of other species of the genus, by the enormous size of the nasal bones[1], and by certain other differences which are noticed in the account of the next species. Subjoined are the dimensions of the skull of the specimen from which the foregoing description is taken (see column No. 1); those of a skull, in the museum of the Zoological Society, upon which Mr. Gray founded his *Acanthion Cuvieri*[2] (col. No. 2); in column No. 3 are the

[1] Although always to be distinguished by the great development of the nasal cavity, the large nasal bones, and the highly arched upper surface, the cranium of the Common Porcupine is subject to considerable variations in these parts, as will be seen upon comparing the dimensions. As a general rule, where any species is characterized by a maximum of development of certain parts, those parts are more subject to variation in the different individuals of the species than are parts which approach more nearly to the normal conditions.

[2] Mr. Gray admits that the animal described by me under the name *Hystrix cristata* is specifically identical with his *Acanthion Cuvieri*, but he gives a new specific name to this animal, because he supposes another species to be the true *H. cristata* of Linnæus. We have not the means of determining to which of the crested Porcupines Linnæus applied the name *cristata*: he says his animal is found in Africa and Asia, and it is more probable that he had the Common North African animal in view than the Asiatic species, which is now known to be distinct: be this as it may, when two species are confounded together, as have been the African and Asiatic, crested Porcupines, we should, to avoid confusion, adopt the names for the two species, as applied by the person who first clearly points out their distinctions. The most striking differences in the two animals are found in the structure of the skull; and, judging from the figure of the skull given by Schreber (more than fifty years back,—see his Säugth. Pl. 166), we cannot doubt that his *Hystrix cristata* is identical with the animal so named by F. Cuvier and Brandt (who have also figured the skull),

admeasurements of a skull from Tunis; it has but three molars, and belongs, therefore, to a young animal; and, lastly, the admeasurements of a skull of the *H. cristata*, described by Dr. Wagner (col. No. 4).

	No. 1.		No. 2.		No. 3.		No. 4.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines	Ins.	Lines.
Total length of skull	6	4	5	7	5	2	5	3
Width of ditto from the outer surface of the zygomatic arches...	3	4	3	2	2	10		
" " between orbits ...	3	0	2	5	2	5	2	6
" of palate between second pair of molars		6				5⅓		
Length of nasal bones	3	9	3	0	2	11½	3	7
Greatest width of ditto, behind...	2	9	2	1½	1	0⅓		*
" " in front...	1	7	1	3	1	3		
Length of frontal bones, measured in the middle line of the skull	1	2½			1	0	1	0
" of parietal bones, ditto, to occipital crest ...	1	1			1	2	1	1
Width of intermaxillary in front (from the posterior outer edge of the alveolus of incisor, back to the intermaxillary suture, opposite anterior root of zygoma)	1	4½	1	1½	1	0⅔		
" of do. measured behind ...		3½		4⅓		3¾		4⅓
Vertical diameter of ant-orbital opening		5½		6		5		
Length of lower jaw	4	2	3	11			3	0
Height of ditto, measured from the condyle	1	5	1	3				

Wagner, and myself. Brandt first clearly defined the two species, and Wagner subsequently confirmed all the essential points of distinction noticed by him in a paper (evidently embodying the results of a careful examination) published in the Archiv für Naturgeschichte.

* Dr. Wagner gives as the width of one of the nasal bones on the hinder part, 1″ 5‴; in the skulls measured by myself, the same part gives 1″ 8‴ in No. 1; 1″ 1½‴ in No. 2; and 1″ 1⅓‴ in No. 3.

The Common Porcupine inhabits Italy (in the Appenines), Sicily, and Spain, to which parts it is supposed not to be indigenous, its true habitat being the northern parts of Africa. Dr. Wagner informs us that he has received a specimen of this animal from the Upper Nile; and on the western side of the continent we are certain that it extends as far as the Gambia. Mr. Fraser has recently brought to England living specimens from the neighbourhood of Tunis, and a skull, which accompanied them (now in the British Museum), I find agrees very closely with that figured in Pl. 20. This animal seeks its retreat in holes in rocks, or it burrows in the ground for shelter. Its food consists of various kinds of vegetable substances, and its flesh is well flavoured. When irritated, to defend itself it erects its formidable quills; and the long crest on the back of the neck is at the same time elevated. It emits a succession of short grunts, and, moreover, it makes a rattling noise with the tuft of hollow quills at the end of its tail, by rapidly vibrating that organ. Further, it will strike the ground with its feet, as do the Hares.

HYSTRIX HIRSUTIROSTRIS.

The Asiatic Porcupine.

Hystrix hirsutirostris. BRANDT, Mamm. Exot., &c. p. 39, Pl. 8, figs. 3—6 (skull and lower jaw). 1835.

" " WAGNER, in Archiv für Naturgesch. 1842, p. 29; Schreb. Säugth. Suppl. iv. p. 17. 1844.

" *cristata* et *leucurus*. GRAY, Proc. Zool. Soc., June 1847; Annals and Magaz. of Nat. Hist. for Nov. 1847, vol. 20, pp. 350 and 351.

" *leucurus*. SYKES, Proc. Zool. Soc., July 1831, p. 103.

Bristles of the crest black-brown, with but little admixture of white; muzzle densely clothed with hair; short quills along the mesial line of the rump, white; longest quills of the

back with the white much extended on the terminal portion hollow quills of the tail very broad.

Skull with the nasal bones of moderate width, the lateral margins parallel, or nearly so, the hinder margin terminating in a line with the anterior boundary of the orbit; intermaxillary bones truncated behind, as broad at that part as in front.—See Pl. 20, figs. 2 and 2 *a*.

Inhabits continental India, and extends westwards to Syria and Lycia.

Although, when the crania of the African and Asiatic species of Crested Porcupines are compared, many well-marked differences present themselves, yet in the external characters of the two animals—in the colouring, in the quills and spines, or in size and proportions—the differences are by no means striking. Colonel Sykes, many years back, expressed an opinion that they were distinct, and pointed out certain characters which he imagined might serve to separate them, but the characters referred to are none of them distinctive[1]. Judging from the cranium, the head of the *H. hirsutirostris* must be less arched, and the muzzle less obtuse, than in the *H. cristata*; but these differences would not be obvious in stuffed specimens: the chief distinguishing character pointed out by Brandt is, that the muzzle in the

[1] The distinction on which Col. Sykes lays most stress is that the quills of the tail of the Indian animal are all of them white; whilst in the *H. cristata* such, he says, is not the case: and hence he proposed the specific name *leucurus* for the Indian species. According to my observations, all the quills on the terminal and under parts of the tail are white in both species; at the basal portion of the tail in the Indian Porcupine, nearly all the quills are white, but some few are party-coloured, whilst in *H. cristata* sometimes but few of the quills at the same part are white, the remainder being party-coloured, and sometimes many are party-coloured. Had Col. Sykes discovered any good points of distinction between the two animals, it would perhaps have been desirable, on the score of priority, to have adopted his specific name, though not very appropriate; but as he failed to do so, I adopt the *appropriate* name given by Brandt, who has clearly defined the species.

much more extended in the longitudinal direction of the cranium, and they join the parietals behind by a distinctly serrated suture; in *H. cristata* there is an indentation between the frontal and parietal bones, and the suture is scarcely serrated: the palate is narrower, and the sphenoid alæ less widely separated. The lower jaw is distinctly deeper[1].

[1] All the above peculiarities apply equally well to two skulls which Mr. Gray regards as belonging to a distinct species, and which that author supposes is the true *H. cristata* of Linnæus. I cannot think, however, that certain differences noticed in the skulls in question, when compared with the skulls of *H. hirsutirostris*, are sufficiently important to indicate a distinction of species. One of these skulls belonged to an adult animal, which died in the Surrey Zoological Gardens, and its habitat is uncertain; the other belongs to a very young animal, in which but two molar teeth of each series are developed: it was brought from Xanthus. The adult skull differs from the skulls of *H. hirsutirostris* brought from India, in being rather narrower; but the chief distinction consists in the frontal process being considerably broader behind than the nasal bone. The young skull from Xanthus, on the other hand, is distinctly broader than the Indian skulls, and the intermaxillary is but little broader than the nasal bone. A cranium described by Dr. Wagner, which was removed from a Porcupine from Jerusalem, has the nasal bone and the intermaxillary equal in width. In the skulls of *H. hirsutirostris*, I may observe, the hinder part of the intermaxillary bone is usually about equal in width to the same part of one of the nasal bones, but sometimes the intermaxillary is somewhat distinctly broader than the nasal bone. The following admeasurements of the two parts in question in several crania will give an accurate idea of the amount of difference which exists between Mr. Gray's *H. cristata* and the *H. hirsutirostris*:—

	Intermaxillary.	Nasal bone.	
	Lines.	Lines.	
Specimen from the Surrey Gardens ...	14⅓	9	*H. cristata.* Gray.
" from Xanthus	9⅓	8	
" from Jerusalem	8	8	*H. hirsutir.* Wagner.
" in the Zoological Society's museum	10	8	
" from Continental India ...	11	9	
" from ditto			
" from Nepal	10	10	

In a skeleton from Nepal, presented to the British Museum by Mr. Hodgson, I find one more dorsal vertebra (and consequently an extra pair of ribs) than exists in the skeleton of the Gambia specimen of *H. cristata*, there being fifteen dorsal vertebræ in the former, and fourteen in the latter. This Nepal skeleton is remarkable for having eight cervical vertebræ; the eighth, having the transverse process perforated like the preceding vertebræ. There are four lumbar vertebræ in both the skeletons referred to.

We are certain that the *Hystrix hirsutirostris* is found in the central parts of Hindoostan; that it occurs in the upper, central, and lower parts of Nepal, we are informed by Mr. Hodgson; and that it is a native of Syria (in the neighbourhood of Jerusalem) we learn from Dr. Wagner. As travellers speak of "the Porcupine" as being found in Persia, and Dr. Griffith states that it occurs in the lower parts of Afghanistan[1], it is highly probable that it is the *H. hirsutirostris* which inhabits these intervening countries. Whether it be this species or the *H. cristata* which inhabits the Cape of Good Hope, I cannot determine; the only specimen from the Cape which I have seen is in so very bad a condition, that I will not venture to give an opinion.

[1] See Journal of the Asiatic Society, vol. x.

	Continental India.[1]						*H. cristata.* Gray.		Nepal.		Nepal.		Specimen in Zoological Soc.'s Museum.		*H. hirsutirostris.* Wagner. Jerusalem.	
	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.	Ins.	Lines.
Total length of skull	5	9	5	10	6	1¼	5	11	5	5	5	3	4	11	4	11
Width of ditto	3	5	3	4	3	5	3	0	2	11	3	0	2	8½	2	9
" between orbits	2	3½	2	6½	2	11½	2	4	2	2	2	1½	2	2	2	1½
Length of nasal bones	2	9½	2	11	3	2	2	8	2	6	2	3	2	2	2	3
Width of ditto, behind...	1	6⅓	1	9	1	7½	1	7½	1	6¾	1	6	1	3		
" in front	1	3¼	1	6	1	4	1	4½	1	4¼	1	2¾	1	1¼		
Length of frontal bones	1	8	1	9½	1	8½	1	10			1	8½	1	8	1	9
Width of intermaxillary bone behind		11		11½		11½	1	2½		9¾		10		10		8
" " in front		11½	1	1	1	0½	1	0⅓	1	0¼		11½		10		
" of palate between the foremost molars		4⅓		4½		4⅓		3⅔		4		4⅓				
" " between the hindermost		6¼		6¼		6		5¾		6		6⅔				
Vertical diameter of ant-orbital opening		7½		6¾		7		6		5		5½		5		
Length of lower jaw	4	1			4	3	4	0	3	9	3	10			3	5
Height of ditto	1	8			1	9½	1	9½	1	6½	1	8				

[1] One of these skulls has five molar teeth on one side of the upper jaw.

SECT. 2. *Head and back of neck destitute of a crest.*

HYSTRIX HODGSONI.

Crestless Nepal Porcupine.

Hystrix Hodgsonii. GRAY, Proc. Zool. Soc. for June, 1847; Annals and Mag. of Nat. Hist. for Nov. 1847, vol. xx p. 352.
" *alophus.* HODGS., Journ. of the Asiatic Soc. of Calcutta for Aug. 1847, p. 772, Pl. 32.

General hue brown-black; head brown; in the visible portions of the quills the black prevails over the white, but numerous very long and slender quills are almost entirely white: the spiny bristles, which form the chief covering of the animal, are rather long and slender, and have long hair-like points. —Skull, Pl. 20, fig. 3.

Inhabits Nepal.

This animal is easily distinguished from the *H. cristata* and *H. hirsutirostris* by the total absence of a crest on the back of the neck and head: excepting the hinder portion of the back, and the tail, almost every part of the animal is covered with spiny bristles, and these are relatively longer than in the two preceding species of Porcupines: the longest (which are found immediately in front of the quills) measure, many of them, as much as three inches in length; they all terminate in an elongated hair-like point, are rather distinctly grooved on the outer surface, and have a nearly square section. Mixed with these spiny bristles are a few hairs, and on the muzzle and feet they are replaced by hairs; on the latter, the hairs are very coarse. Quills cover the whole hinder half of the back, and extend down the sides of the body to the base of the leg: the tail is also covered with quills. The quills are proportionately shorter than in the Common

Porcupine, and, as in that animal, there are shorter, and stouter, sharply-pointed quills, and others which are slender and flexible. The longest of the latter measure about ten inches in length; they are for the most part white; some are entirely white, and others are white with a black ring about midway between their extremities. Of the shorter spines, some have the basal half white, and the apical half black; others are white, but with a very broad black ring towards the point. The quills on the tail are most of them partly black and partly white, but those on the under surface are entirely white, as are also the hollow truncated quills at the end of the tail. The prevailing colour of the animal is brown-black; the head is brown; the white collar on the neck is very indistinct. The spiny bristles are white at the root. The muzzle is well clothed with hairs, and the ears are rather small. The whole length of the animal is 20 inches, of which the tail, with its quills, measures about 4 inches; the hind foot and nails is 3″ 1‴.

The above description is taken from a specimen presented to the British Museum by Mr. Hodgson, which specimen is likewise the original of Mr. Gray's description. It is not quite full-grown, but we are indebted to Mr. Hodgson for a detailed account of the peculiarities of this species, drawn up from an adult male specimen. According to this author, "the Crestless Porcupine" of the sub-Himalayas, measures from 22 to 24 inches, from the tip of the nose to the root of the tail; its tail (without including the quills) measures 4 inches; and its weight is from 16 to 21 lbs.

"The head, neck, fore half of the body, and entire belly and limbs, are covered with spinous bristles, which have a pretty uniform length of from 2 to 3 inches, but are shortest and feeblest on the head and limbs. The hinder part of the body, or croup, and tail, only, are armed with true quills, of which the longest thick ones are about 7 inches, and the

longest thin ones, about 12 inches. The tail is conico-depressed, thick, and about one-sixth of the animal's length. Its longest thick quills are 3 to 4 inches; and its longest thin ones, 5 to 6 inches. The rattle at the end of the tail consists of from 35 to 40 hollow cylinders, of about an inch in length, some of which are closed, and some open, at the distant end. The skin of the body is pure white. The iris brown. The nudish lips, and soles of the feet, fleshy-brown. The spinous bristles black, save on the head, where they are less deep-hued, passing to brown. The white collar is very narrow and vague. The quills white, with *but one* sub-central black ring; those of the inferior surface (only) of the tail, being all white."

	Inches.	Lines.
From nose to root of tail	23	6
Length of tail	4	0
" of ditto, including the hollow quills ...	5	6
Mean height	8	0
Girth of chest	18	0
Length of fore foot and nails	2	7½
" of hind foot and nails	3	4½
Ear, from the lobe	1	3

"Porcupines (says Mr. Hodgson) are very numerous, and very mischievous, in the sub-Himalayas, where they depredate greatly among the potatoe, and other tuberous or edible rooted crops. They are most numerous in the central region, but are common to all three regions. They breed in spring, and usually produce two young about the time the crops begin to ripen. They are monogamous, the pair dwelling together in burrows of their own formation. Their flesh is delicious, like pork, but much more delicately flavoured, and they are easily tamed, so as to breed in confinement. All tribes and classes, even high-caste Hindoos, eat them, and it is deemed lucky to keep one or two alive in stables, where they are encouraged to breed. Royal stables are seldom without at least one of them. The Partbattiahs call

them *Dumsi*; the crested one[1], *Chotia Dumsi*; the uncrested, *Anchotia*[2] *Dumsi*. The Lepchas and Lambus of Sikim do not distinguish the two species, but call them both *Sathung* and O'—ó, in their respective languages."

The valuable series of crania and skeletons which accompanied the extensive collection of Nepal animals presented by Mr. Hodgson to the British Museum, contains two skulls of the *Hystrix Hodgsoni*, one of which is figured in Plate 20 (fig. 3) of half the natural size: they are readily distinguished from the second species found in Nepal—the *H. hirsutirostris*—by the nasal bone being rounded behind, and much more prolonged beyond the fronto-intermaxillary suture: here they terminate in a line with the middle of the orbit. Another very striking distinction is seen in the form of the frontal process of the intermaxillary, this process being exceedingly contracted, and almost terminating in a point in *H. Hodgsoni*, and broad and truncated in *H. hirsutirostris*; the frontal bones are much less extended in the longitudinal direction, and the parietal bones are more extended than in the last mentioned animal. The nasal cavity is much smaller than in the skull of *Hystrix cristata*; the skull is much narrower, and very little arched above; the parietal bones are considerably more extended in the longitudinal direction; the ant-orbital opening is larger; the palate narrower between the molar teeth, and the crowns of these teeth are very nearly round. Both skulls present the above distinctions; one of them is somewhat fractured; the admeasurements of the other are as follows:—

	Inches.	Lines.
Total length of skull	4	10
Width of ditto	2	6
" " between orbits	1	8

[1] *Hystrix hirsutirostris.*

[2] Achotia, meaning uncrested; and Chotia, crested.

Length of nasal bones	2	$6\frac{1}{3}$
Width of ditto, behind	1	$4\frac{3}{4}$
" " in front	1	0
Length of frontal bones, in the mesial line ...		$10\frac{1}{4}$
Width of intermaxillary bone, behind ...		$1\frac{2}{3}$
" " in front ...		10
" of palate, between the second pair of molars		3
Vertical diameter of ant-orbital opening ...		$5\frac{1}{6}$
Length of lower jaw	3	3
Height of ditto, from condyle	1	3

HYSTRIX JAVANICA.

Java Porcupine.

Acanthion Javanicum. F. CUVIER, Mém. du Mus. ix. pp. 425 and 431, Tab. 20 bis. figs. 3 and 4 (skull), 1822; Dict. des Sci. Nat. xlii. p. 530 (1826).

" " VAN DER HOEVEN, Nov. Act. Bonn. xix. i. p. 182, Tab. 19, fig. 4 (lower jaw). 1839.

Hystrix torquata, and *Acanthion Javanicum.* VAN DER HOEVEN, Tijdschr. iii. p. 110. 1836.

" *fasciculata.* MÜLLER, Verhandl. over de Naturlijke Gesch. der Nederl. Overzeeschte Bezittingen, Zool. i. p. 36. 1839.

" *brevispinosa.* WAGNER, Schreb. Säugth. Suppl. iv. p. 20. 1844.

Acanthion Javanicum. GRAY. Proc. Zool. Soc. for June 1847; Ann. and Mag. of Nat. Hist. for Nov. 1847, vol. xx. p. 353.

Body for the most part covered with stiff and somewhat depressed spines, which are distinctly grooved on the outer surface, and have prickly points; hinder half of the back, and the tail, covered with quills; the quills rather short: those at the end of the tail hollow, and pedunculated: general tint brown (or, sometimes, black), freckled with dirty yellow; the stouter quills brownish yellow, with a sub-terminal, broad, dusky ring; the longer and more slender quills, with the exposed ends dirty yellow.—Skull Pl. 20, fig. 4.

Inhabits Java, Sumatra, and Borneo.

The Java Porcupine is considerably smaller than the

H. cristata and the *H. Hodgsonii*, and is not only distinguished from those species by the absence of the crest, but by the spines, which form the chief covering of the body, being stouter, and by their terminating in a prickly point. This peculiarity in the spines also distinguishes the present animal from the crestless Porcupine of Nepal. In the three preceding species the spines terminate in a flexible hair-like point, but in the *H. Javanica*, though the spines terminate in an acute point, that point does not yield to the touch. The spines, moreover, are more distinctly grooved on the outer surface than in the other species of Hystrix, the broad longitudinal furrow on that part being very evident to the naked eye: their average length is about 2¼ inches, and their greatest width is about $\frac{1}{14}$th of an inch. On the head, and under parts of the body, the points of the spines are thin, elongated, and flexible. The quills are shorter even than in the *H. Hodgsonii*; the average length of the stouter quills being about 3 inches, and that of the more slender quills varying from 6 to 8 inches: these latter spring from near the middle of the back, and some from the sides of the body. The hollow quills at the end of the tail, which, as in the preceding species, are supported upon a long and slender stalk, are many of them about an inch and a quarter in length, and about 1½ lines in width. The muzzle and chin are clothed with hairs; the hairs of the moustaches are very long, some of them brown, and some black. The feet are covered with long black bristly hairs. Usually the prevailing hue of the animal is brown, but freckled with dirty yellow. The spines are of a dirty yellow-white at the root, and brown beyond; many of them, however, have a short pale point. The stouter quills are of a dirty pale yellow, but have a broad, subterminal, dusky ring, often about an inch in width, and leaving a pale point of about an inch in length. The whole of the visible end of the longer and more slender quills is

dirty yellow. The hollow quills at the end of the tail are dirty white. A distinct yellowish collar encircles the fore part of the neck, and is sometimes very broad at the lower part.

Five out of six specimens which I have examined agree with the above description; four of them are from Java, and form part of the collection in the Leyden Museum; a fifth specimen, in the same collection, differs in having the general hue black; in the dirty yellow of the quills and spines being replaced by an impure white, and in having a broad transverse white patch on the under side of the neck near the chest. This is perhaps from Sumatra, since Müller informs us that the specimens from that island are darker even than those from Borneo, which latter are of a deeper hue than the Java specimens. A specimen in the British Museum has a large dirty white patch on the neck, immediately in front of the chest.

	Inches.	Lines.
Length from tip of nose to root of tail ...	20	0
" from nose to ear	4	4
From upper portion of ear, about		7
Length of fore foot and nails	2	4
" of hind foot and nails	3	1
" of tail, including the hollow quills, about	3	6

The skull of the *Hystrix Javanica* has the same elongated and narrow form (as compared with that of *H. cristata*) which we observe in the skull of the *H. Hodgsonii*, but it differs much in other respects from the skull of the last mentioned animal. Viewing it above, two striking differences present themselves,—the comparatively small size of the nasal bones, and the greater extent of the frontals. Here the nasal bones are relatively narrower, and they are truncated behind, where they terminate in the same transverse line as the anterior margin of the bony ring, which encloses the ant-

Fossil species of Hystrix.

Cuvier refers to a species of *Hystrix*, a molar tooth found in the Val d'Arno; and Messrs. Falconer and Cautley have noticed remains of Porcupines amongst their Sewalik Hill fossils.

Genus, *Atherura.*

Atherura. CUVIER, Règne Animal, 2d ed. (1829, i. p. 215).

Hystricina proper, with the tail nearly as long as the body, cylindrical, of moderate thickness, scaly, with scattered, small stiff bristles in the middle, and with a large tuft of long flat bristles on the apex; ears sub-ovate, clothed with small hairs: skull with the nasal cavity of moderate size.—See Pl. 18, figs. 5 and 6.

Habitat, Africa and Southern Asia.

The dentition of the species of this genus can be scarcely said to differ from those of the genus *Hystrix*: when but moderately worn, the upper molars in the *Atherura macroura* have three deep folds of enamel entering from the outer side of the tooth, and one internal fold, as represented in fig. 6 *b* of Pl. 18.

ATHERURA FASCICULATA.

Indian Brush-tailed Porcupine.

Hystrix fasciculata. SHAW, General Zoology, ii. Pt. 1, p. 124 (1801).
" *macroura.* GERVAIS, Voyage de la Bonite, Mammif. p. 60, Pl. 11, figs. 4 to 6 (skull and lower jaw).
Le Porc-épic de Malacca. BUFF., Suppl. vii. p. 303, Tab. 77.

manner; but, above the shoulders, in the mesial line of the back, we can perceive a slight trace of the crest, which distinguishes the female parent; this crest is composed of very stiff, white-pointed bristles, which are from three to five inches in length. In colouring the animal agrees very closely with the dark variety of the *H. Javanica*; its prevailing hue being black.

Body for the most part covered with depressed spines, which are strongly channelled on the outer surface; tail, at the root, covered with similar spines; in the middle it has very short bristles scattered on the scaly skin; and at the apex it is provided with a large tuft of long flattened bristles: general hue brown—the spines white at the root; the bristles at the end of the tail dirty white, and often dusky at the point.

Inhabits Siam, and the Malay Peninsula.

Of a Porcupine agreeing with the *A. fasciculata* of Shaw, I have examined four specimens, all of which are from Siam, and form part of the Leyden collection.

In general appearance the animal reminds one of a large Rat, but the head is rather shorter than usual in the Rat group. The ears are semi-ovate, somewhat emarginated behind, and have thin, scattered dusky brown hairs (many of them rather long) springing from their surface. The hairs of the moustaches are very long and stout, and of a brown hue. The extremity of the muzzle is entirely clothed with hairs. The feet are short; and each foot is provided with five toes, but the inner toe of the fore foot is extremely short, and it has a short rounded nail; the inner toe of the hinder foot is less short, and has a larger nail, which is pointed like the nails of the other toes; these are rather short, moderately arched, and not very deep, neither are they much compressed. The upper surface of the feet is clothed with coarse brown hairs; the under surface is naked. The covering of the animal consists of depressed spines, which are flat on the under surface, and concave in the transverse direction, on the upper surface; they are sharply pointed, and broadest at a short distance from the root: their average length is about one inch, and their width, one line. The spines on the under parts, however, are smaller, and relatively narrower. Mixed with the spines on the back are some long and stout bristles, projecting, some of them, as much as three inches beyond the

spines. Upon parting the spines a very scanty growth of fine, pale coloured hairs is visible. The tail is considerably shorter than the body, and moderately thick; about one inch, being the basal portion, is covered with spines like those on the body; beyond this, the organ is covered with rhombus-shaped scales, and presents numerous longitudinal ridges, each scale being ridged along the middle. The distal extremity of the tail is provided with a large tuft of flattened bristles (somewhat resembling thin and narrow strips of whalebone); they are from three to four inches in length, of a dirty white colour, but with the tip sometimes dusky.

The general tint of the animal is yellowish brown, freckled with dusky brown, especially on the back: the spines, taken separately, are brown-white at the root, and become gradually darker to the point: the points of the spines on the back are very dark, being of a blackish brown colour. The long and stout bristles which are mixed with the spines on the back are similarly coloured.

	Inches.	Lines.
Length from tip of nose to root of tail ...	18	0
" from nose to ear	2	3
" of ear		6
" of tail, not including the tuft ...	7	6
" of fore foot	1	7
" of hind foot	2	2

Atherura macroura.

Hystrix macroura.	Linn., Syst. Nat. 12th ed. p. 77 (1766).
" "	Schreb., Säugth. iv. p. 607, Pl. 170 (1792).
" "	Shaw, Gen. Zool. ii. Pt. 1, p. 9, Pl. 124 (1801).
" *fasciculata.*	Gray, fig. in Illustr. of Indian Zoology.
Porcus aculeatus, &c.	Seba, Thesaurus, i. p. 84, Pl. 52, fig. 1 (animal), and fig. 2 (end of the tail).
Long-tailed Porcupine.	Pennant, Syn. of Quadr. p. 263 (1771).

Body for the most part covered with flattened spines, which are grooved along the outer surface; those on the hinder

part of the back long, being about four inches in length, and having nearly a square section: mixed with the spines of the hinder part of the back are some very long spiny bristles, the exposed ends of which are of a yellowish white colour: scales on the tail nearly square, and behind each scale springs a small stiff spine, and several very short bristles; apex of the tail provided with a large tuft of flat bristles, which are spirally twisted, and alternately contracted and expanded: upper parts of the animal deep brown; sides of the body freckled with brown and dirty yellow; abdomen dirty yellow; feet dark brown; tuft at the end of the tail dirty white.

Inhabits Sumatra?

The above are the principal peculiarities of an animal which I saw in the Leyden Museum. According to my notes it was larger than either of four specimens of the *A. fascicu-lata* from Siam, and differed in having the spines much longer, especially those on the hinder part of the back, some of which were five or six inches in length. It differed, moreover, in having the spiny bristles—which spring from the same parts (some of which were seven or eight inches in length)—of a yellowish white colour—at least their exposed ends; in having the tail proportionately shorter[1], and in the form of the flattened bristles at the end of the tail, these being alternately contracted and expanded[2]: these bristles measured from three to four inches in length, and they were,

[1] The notes referred to, state that all four of the Siam specimens alluded to agreed in having the tail relatively longer and more slender than in this animal; that they all had the flat bristles at the end of the tail of uniform width—not alternately contracted and expanded; and the long spiny bristles of the back were brown.

[2] This peculiarity is particularly noticed by Seba, who, moreover, figures the terminal portion of the tail to show the curious modification of the hairs or bristles forming the tuft on that part. Seba attributes irridescent colours to the animal—perhaps his specimen was preserved in alcohol, and was wet when examined.

most of them, three quarters of a line in width in the expanded parts. The hairs of the moustaches were immensely long, some of them as much as seven inches in length. Its dimensions are—

	Leyden Museum. Inches.	Lines.	Brit. Mus. Inches.	Lines.
From tip of nose to root of tail ...	20	0	16	3
" ditto to ear	2	11		
" of ear		8½		8
" of tail, not including the tuft ...	7	9	7	6
" of fore foot	1	10	1	8
" of hind ditto	2	11	2	5

I add the dimensions of a second specimen, clearly referrible to the same species, which is contained in the British Museum collection. It is an immature animal, having but three molar teeth developed on each side of its' jaws; but agrees with the Leyden specimen in having long spines, with nearly a square section, on the hinder part of the back, in having the interspersed very long bristles almost entirely whitish, and in having those forming the tuft at the end of the tail flattened, and alternately contracted and expanded, but the expanded parts are narrower, being not more than two-thirds of a line in width, and generally less; and there are many interspersed simple bristles. The ordinary spines are white at the base, and dusky brown at the apex; or, many of them, especially on the sides of the body, have the basal half white, a short white point, and the intermediate space dusky brown. The longer spines on the hinder part of the back are from three to four inches in length, nearly square, but rather broader than deep, and strongly grooved on the upper surface. The still longer stout bristles on the same part, and on the sides of the body, are some of them entirely dirty white, and some of the same pale hue, but with a brownish space, of no great extent, near the middle. The under parts of the animal are of a dirty yellowish white colour, if we except the chest, which is somewhat suffused with

brown. Very stout, but short, pointed bristles spring from between the square scales on the tail, and these are for the most part dusky; the tuft at the end of the organ is white. The very long hairs of the moustaches are some of them entirely dusky brown, and some dirty white, but most of them with the basal half (excepting quite at the root, where they are pale) brown, and the apical half, dirty white: long bristles spring from the cheeks. About one-third of the tail is covered with spines like those on the body. The native country of this specimen is not known[1].

The skull of the specimen last described differs much from a cranium figured in the *Voyage de la Bonite* (Pl. 11, figs. 4 and 5) under the name *Hystrix macroura*. Although belonging to an immature animal, the length of the skull in the British Museum, measured from the posterior root of the zygoma, to the front of the incisor, is equal to that of the adult skull represented in the figures above referred to, and hence we must conclude that the British Museum cranium would have been longer than the adult one, had the animal to which it belonged, lived to attain to maturity. The immature skull is much narrower (viz. 3 lines) than the mature one; the distance between the anterior edge of the ring, which encloses the ant-orbital opening, is greater by 1¾ lines, whilst the zygomatic arch is shorter. The most striking differences, however, are noticeable in the zygoma. The process of the intermaxilllary which encloses the ant-orbital opening, is represented in the figures in the *Voyage de la Bonite*, as being compressed from before backwards, whilst in the British Museum cranium the same process presents a broad outer

[1] Dr. Müller states that the *Hystrix macroura* (but under this name I suspect he includes the animals which have received the names *macroura* and *fasciculata*) generally inhabits the main land, that it appears to be tolerably abundant in Siam, and is found likewise at Malacca. In the Archipelago it is apparently confined to the eastern coast of Sumatra, most of the specimens which came under his notice having been from the district of Palembang.

surface (full two lines in width), and is narrower in the opposite direction. Here the malar bone is three times as deep under the orbit as it is behind, where it joins the zygomatic process of the temporal bone; whilst in the "Bonite" specimen the malar bone is a trifle narrower in front than behind; there is no trace of a post-orbital process to the frontal bone, which is so distinct in the figures; neither is the frontal bone contracted behind. The palate is deeply emarginated behind.—See Pl. 18, fig. 6 *a*.

I strongly suspect the skull figured in the "Bonite" will be found to belong to the *Atherura fasciculata*. The dimensions of the cranium removed from the specimen of *A. macroura* in the British Museum, are as folllows:—

	Inches.	Lines.
From the front incisors to the hinder root of the zygoma	2	3
Width from outer surface of zygomatic arches	1	$6\frac{1}{2}$
" between orbits	1	$0\frac{2}{3}$
Length of nasal bones		$9\frac{3}{4}$
Width of ditto, behind		$5\frac{1}{3}$
" " in front		$5\frac{1}{2}$
Length of frontal bones	1	3
" of zygomatic arch	1	$3\frac{1}{3}$
From front of incisor to first molar ...	1	$0\frac{3}{4}$
Width of palate between the second pair of molars		$2\frac{3}{4}$

ATHERURA AFRICANA.

African Brush-tailed Porcupine.

Atherura Africana. GRAY, Annals and Mag. of Nat. Hist. for Dec. 1842, vol. x. p. 261; and for Nov. 1847, vol. xx. p. 355.

" *fasciculata.* BENNETT, Gardens and Menagerie of the Zooological Society, i. p. 175.

Body covered with depressed spines; long spines interspersed with the ordinary spines on the hinder part of the back,

having nearly a round section, besides very long spiny bristles : tail spiny at the base, scaly in the middle, and with a tuft of long flat bristles, which are alternately expanded and contracted.—Skull, Pl. 18, fig. 5.

Inhabits the west coast of Africa (Sierra Leone and Fernando Po.)

A specimen in the Museum of the Zoological Society, which is the original of Mr. Bennett's description in his work above quoted, has the ordinary spines on the body about an inch and a half in length, or some an inch and eight lines, and very nearly a line and a half in width : they are flat beneath, and concave in the transverse direction, above, and very sharply pointed. The under surface of their apical end is thickly studded with exceedingly minute prickles, the points of which are directed forwards; these prickles make their appearance at a short distance from the point, and may be traced nearly half way down the spine ; the lower half is smooth. On the hinder part of the back there are many large spines, measuring about four inches in length, and nearly two lines in diameter at the thickest part, and these have nearly a round section. Besides these, there are some flexible spines, or spiny bristles, which are still longer : they have a round section, and are about a line in diameter at the thickest part, which is immediately above the root. The general colour is brown ; on the back, dusky brown : the spines are dirty white at the root, and shaded through brown to brown-black, which is the colour of the point. On the sides of the body many of the spines are tipped with white ; brown below the point, and white at the root. The under parts are brownish white, but there is a brown patch on the chest. The very long hairs of the moustaches are most of them whitish at the root, and brown beyond. The tuft at the end of the tail is white.

Geographical Distribution of the Hystricidæ.

In the following tables asterisks are introduced opposite the names of the species in those columns which are headed by the names of the districts which such species are known to inhabit: thus, the first mentioned species (*Dolichotis Patachonica*) is found in La Plata and Patagonia; and, so far as we are aware, in no other parts. Upon inspecting these tables it will be seen that the great metropolis of the *Hystricidæ* is Brazil; that those which I have given reasons for regarding as the lowest species of the group, are either found at great elevations on the Andes, or in the more southern portions of the continent; that the species of the typical division, the *Echimyina*, almost entirely occur in the central parts of South America; but that this division has representatives from Cuba in the north, down to the southern portions of Chile[1]. The *Cercolabina* are also chiefly central, but extend as far north as Mexico; and a somewhat aberrant form (*Erethizon*) is found even in the northern parts of North America. The *Dasyproctina* have a tendency to increase in number in the northern parts of South America, and extend into the West Indian Islands. The two aquatic species *Myopotamus Coypus* and *Hydrochærus Capybara* have each a very wide range.

The Old World Porcupines, though belonging to the same great family type (*Hystricidæ*), decidedly exhibit a very aberrant modification of that type.

[1] It is to this section that belong the two most singular exceptions in the distribution of the family—I allude to the *Petromys typicus* and *Aulacodus Swinderianus*, both of which are found in Africa.

	West Indies.	Venezuela, Guayana.	Peru—west of the Andes.	Peru—east of the Andes.	Brazil.	Bolivia - east of the Andes.	Paraguay.	La Plata.	Patagonia.	Chile.	Andes of Peru.	Andes of Chile and Bolivia.
CAVIINA.												
Dolichotis Patachonica	...	...	...	...	...	...	...	*	*	...	...	...
Cavia (Cerodon) rupestris	...	...	...	...	*	...	...	...	..	...	...	...
Cavia A. 1 (Cerodon) flavidens	...	...	...	...	*	...	...	...	...	...	...	...
" " *nigricans*	...	...	...	...	*	...	...	...	...	...	...	...
" " Spixii	...	...	...	...	*	...	...	...	...	...	...	...
" " Boliviensis	...	...	...	...	...	*	...	..	...	...	...	...
" " Australis	...	...	...	...	...	...	...	...	*	...	...	...
Cavia Aperea	...	...	...	...	*	*	*	...	...	...	...	...
" *Cutleri*, Tschudi	...	...	*	...	...	...	...	...	...	...	...	...
" fulgida	...	...	...	...	*	...	...	...	...	...	...	...
" leucopyga	...	...	...	...	*	...	...	...	...	...	...	...
Hydrochoerus Capybara	...	*	...	*	*	*	*	*	...	...	...	...
CHINCHILLINA.												
Lagostomus trichodactylus	...	...	...	...	...	...	...	*	...	...	...	...
Lagidium Cuvieri	...	...	...	...	...	...	...	...	...	...	*	*
" pallipes	...	...	...	...	...	...	...	...	...	...	*	*
Chinchilla lanigera	...	...	...	...	...	...	...	...	...	...	*	*
" brevicaudata	...	...	...	...	...	...	...	...	...	...	*	...
OCTODONTINA.												
Habrocoma Bennettii	...	...	...	...	...	...	...	...	...	*	...	...
" Cuvieri	...	...	...	...	...	...	...	...	...	*	...	...
Octodon Degus	...	...	...	...	...	...	...	...	...	*	...	...
" Peruana, *Tschudi*	...	...	...	...	...	...	...	...	...	...	...	*
" Bridgesii	...	...	...	...	...	...	...	...	...	*	...	...
" gliroides	...	...	...	...	...	...	...	...	...	...	...	*

	West Indies.	Venezuela, Guayana.	Peru—west of the Andes.	Peru—east of the Andes.	Brazil.	Bolivia—west of the Andes.	Paraguay.	La Plata.	Patagonia.	Chile.	Andes of Peru.	Andes of Chile and Bolivia.
OCTODONTINA—*continued.*												
Schizodon fuscus	...	...	...	...	...	...	...	...	...	...	...	*
Spalacopus Poeppigii	..	...	...	...	...	..	...	...	...	*	...	...
Ctenomys Braziliensis	...	...	...	...	*	*	*	*	...	...	...	...
" Boliviensis	...	...	...	...	...	*	...	...	...	...	...	...
" leucodon	...	...	...	...	...	*	...	...	...	...	...	...
" Magellanicus	...	...	...	...	...	...	...	...	*	...	...	...
ECHIMYINA.												
Capromys pilorides	*	...	...	...	...	...	...	...	...	...	..	...
" prehensilis	*	...	...	...	...	...	...	...	...	...	...	...
Plagiodontia ædium	*	...	...	...	...	...	...	...	...	...	...	...
Myopotamus Coypus	...	...	...	*	...	...	*	*	...	*	...	...
Cercomys cunicularius	...	...	...	...	*	...	...	...	...	...	...	...
Petromys typicus[1]	...	...	...	...	...	...	...	...	...	...	...	...
Dactylomys typus	...	...	...	...	?*	...	...	...	...	...	...	...
" amblyonyx	...	...	...	...	*	...	...	...	...	...	...	..
Loncheres cristata	...	*	...	...	*	...	...	...	...	...	...	..
" Blainvillii	...	...	...	...	*	...	...	...	...	...	...	...
" armata	...	*	...	...	...	...	...	...	...	...	...	...
" didelphoides	...	...	...	...	?*	...	...	...	...	...	...	...
" obscura	...	...	...	...	*	...	...	...	...	...	...	...
" semivillosa[2]	...	*	...	...	...	...	...	...	...	...	...	...
" grandis	...	...	...	...	*	...	...	...	...	...	...	...
" macrura	...	...	...	...	*	...	...	...	...	...	...	...
" nigrispina	...	...	...	...	*	...	...	...	...	...	...	...

[1] *Petromys typicus* inhabits South Africa.

[2] *Loncheres semivillosa* is from New Granada.

	West Indies.	Venezuela, Guayana.	Peru—west of the Andes.	Peru—east of the Andes.	Brazil.	Bolivia—east of the Andes.	Paraguay.	La Plata.	Patagonia.	Chile.	Andes of Peru.	Andes of Chile and Bolivia.
ECHIMYINA—*continued.*												
Loncheres unicolor	...	...	...	...	*	...	...	...	...	...	...	...
" picta	...	...	...	...	*	...	...	...	...	...	...	...
" bistriata	...	...	...	...	*	...	...	...	...	...	...	...
" pagurus	...	...	...	...	*	...	...	...	...	...	...	...
" pachyura	...	...	...	...	*	...	...	...	...	...	...	...
Mesomys ecaudatus	...	...	...	...	*	...	...	...	...	...	...	...
Echimys Cayennensis	...	*	...	...	*	...	...	...	...	...	...	...
" albispinosus	...	...	...	...	*	...	...	...	...	...	...	...
" hispidus	...	...	...	...	*	...	...	...	...	...	...	...
" brachyurus	...	...	...	...	...	*	*	...	...	...	...	...
" spinosus	...	...	...	...	...	...	*	...	...	...	...	...
" inermis	...	...	...	...	*	...	...	...	...	...	...	...
" antricola	...	...	...	...	*	...	...	...	...	...	...	...
Aulacodus Swinderianus[1]	...	...	...	...	...	...	...	...	...	...	...	...
DASYPROCTINA.												
Cœlogenys Paca	*	...	...	*	*	*	*	...	...	...	...	...
Dasyprocta Aguti	...	*	...	...	*	...	...	...	...	...	...	...
" croconota	...	...	...	...	*	...	...	...	...	...	...	...
" prymnolopha	...	*	...	...	...	...	...	...	...	...	...	...
" cristata	...	*	?*	...	...	...	...	...	...	...	...	...
" fuliginosa	...	...	...	...	*	...	...	...	...	...	...	...
" Azaræ	...	...	...	...	*	*	*	...	...	...	...	...

[1] *Aulacodus Swinderianus* is from West Africa.

	West Indies.	Venezuela, Guyana.	Peru—west of the Andes.	Peru—east of the Andes.	Brazil.	Bolivia—east of the Andes.	Paraguay.	La Plata.	Patagonia.	Chile.	Andes of Peru.	Andes of Chile and Bolivia.
DASYPROCTINA—*continued.*												
Dasyprocta caudata	...	...	...	...	*	...	.	...	...	...	...	...
" Acouchi	*	*	...	...	...	...	...	...	...	...	...	...
" albida	*	...	...	...	...	...	...	...	...	...	...	...
CERCOLABINA.												
Chaetomys subspinosus	...	...	...	...	*	...	...	...	...	...	...	...
Cercolabes prehensilis	...	*	...	...	*	...	...	...	...	...	...	...
" platycentrotus (?)	...	...	...	...	...	...	...	...	...	...	...	...
" nycthemera	...	...	...	*	*	...	...	...	...	...	...	...
" spinosus	...	...	...	...	*	...	...	...	...	...	...	...
" Novae-Hispaniae[1]	...	...	...	...	...	...	...	...	...	...	...	...
" melanurus	...	*	...	...	*	...	...	...	...	...	...	...
" villosus	...	...	...	...	*	...	?*	...	...	...	...	...
" insidiosus	...	...	...	...	*	...	...	...	...	...	...	...
" nigricans	...	...	...	...	*	...	...	...	...	...	...	...
" affinis	...	...	...	...	*	...	...	...	...	...	...	...
" pallidus	*	...	...	...	...	...	...	...	...	...	...	...
Erethizon[2] dorsatus	...	...	...	...	...	...	...	...	...	...	...	...
" epixanthus	...	...	...	...	...	...	...	...	...	...	...	...
HYSTRICINA[3].												

[1] Cercolabes Novae-Hispaniae inhabits Mexico.
[2] The two species of Erethizon are from the northern parts of North America.
[3] The six or seven species forming the true Hystricina belong entirely to the Old World, being found in Asia and Africa.

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EXPLANATION OF THE PLATES.

Plate 2. Skull and lower jaw of *Lepus* and *Lagomys*, natural size; named on the plate.

Plate 4, Fig. 1. Skull of *Dolichotis Patachonica*, half the natural size; fig. 1*a*, lower jaw of ditto; fig. 1*b*, first and third lower molars, the former magnified.[1]

Fig. 2*b*. First and second right upper molars of *Cavia* (*Cerodon*) *rupestris*.

Fig. 3*b*. Left upper molars of *Hydrochœrus Capybara*, natural size.

Fig. 3*c*. Left upper molars of lower jaw.

Fig. 4. First and second right upper molars of *Cavia Cobaya*.

Plate 6, Fig. 1. First and second lower molars of *Cavia* (*Cerodon*) *rupestris*.

Fig. 2. Ditto of *Cavia* (*Cerodon*), A. 1; most probably the *Cavia flavidens* of Brandt.

Fig. 3. Second upper molar of *Cavia* (*Cerodon*) *Spixii*.

Fig. 4. First and second lower molars of ditto.

Fig. 5. Second upper molar of *Cavia* (*Cerodon*) *Boliviensis*.

Fig. 6. First and second lower molars of ditto.

Fig. 7. Second upper molar of *Cavia* (*Cerodon*) *Australis*.

[1] By mistake marked Pl. 16 on the earlier impressions struck off. Plate 16 (correctly so numbered) contains the skull of Myopotamus, Cercomys, &c.

Plate 6, Fig. 8. First and second lower molars of ditto.

Fig. 9. Ditto of *Cavia Aperea*.

Reference to the above teeth is made in the text at pp. 163 and 184.

Fig. 10. Palatal view of skull of *Cavia* (*Cerodon*), A. 1.

Fig. 11. Ditto, and upper view of skull of *Cavia* (*Cerodon*) *Spixii*.

Fig. 12. Palatal view of skull of *Cavia* (*Cerodon*) *Boliviensis*.

Fig. 13. Ditto of *Cavia* (*Cerodon*) *Australis*.

All the above figures are of the natural size: side views of most of these skulls will be found in Plate 10.

Plate 6*a*, Fig. 1. Side view of the head of an Agouti (*Dasyprocta*), showing the arrangement of the muscles (explained at p. 151). *a a*, is the masseter muscle; *b*, the temporal muscle; *d*, a portion of the digastric; *e*, the infra-orbital nerve.

Fig. 2. Side view of the head of the Viscacha (*Lagostomus trichodactylus*).

Fig. 3. Ditto, with portions of the masseter muscle removed to show the inferior layers of this muscle, and to expose the comparatively small temporal muscle, *b*.

Fig. 4. View of the under side of the lower jaw of the same animal. *a*, the masseter muscle; *c*, *c*, the pterygoid muscles; *d*, the digastric.

*a**, in the above figures, is a portion of the masseter muscle which passes through the sub-orbital (or here, from its position, antorbital) opening.

Fig. 5. Side view of the head of *Capromys pilorides*, half the natural size.

Fig. 5*a*. Front view of the muzzle of ditto; natural size.

Fig. 6. Side view of the head of *Cercolabes prehensilis*; half natural size.

Plate 6*a*, Fig. 6*a*. Front view of muzzle of ditto.

Fig. 7. Front view of muzzle of *Atherura Africana.*

Fig. 8. Ditto of *Lagostomus trichodactylus.*

In the above-named animals, the terminal portion of the muzzle is entirely clothed with small velvet-like hairs.

Fig. 9. Front view of muzzle of *Cricetomys Gambianus.*

Here the part left white on the figure is naked.

Fig. 9*a*. Nostril of the same animal, enlarged.

Fig. 10. Ear of *Lagostomus trichodactylus,* half the natural size.

Plate 8, Fig. 1. Skull and lower jaw of *Habrocoma Bennettii.*

Fig. 2 and 2*a*. ,, *Octodon Degus.*

Fig. 3 and 2*b*. ,, *Octodon Bridgesii.*

Fig. 4. ,, *Schizodon fuscus.*

Fig. 5. ,, *Ctenomys Magellanicus* (from Mr. Bennett's fig.)

Fig. 6. ,, *Ctenomys Braziliensis.*

Fig. 7. ,, *Spalacopus Poeppigii.*

All the above skulls are of the natural size.

Plate 10, Fig. 8. Skull and dentition of *Plagiodontia ædium,* copied (half the natural size) from F. Cuvier's figure.

Plate 10*, Fig. 1*a*. First and second right upper molars of *Chinchilla lanigera.*

Fig. 3. Skull and lower jaw of *Lagostomus trichodactylus,* two-thirds the natural size. The remaining figures are of the natural size.

Plate 12. Skull and lower jaw of *Capromys pilorides,* three-fourths the natural size.

Fig. 6. First and second right lower molars magnified.

Plate 14, Fig. 1. Skeleton of *Capromys pilorides,* reduced in size. See p. 291.

cr.	the cranium.	*r.*	radius.
cv.	cervical vertebræ.	*cp.*	carpus.
dv.	dorsal vertebræ.	*mc.*	metacarpus.
rb.	ribs.	*pl.*	phalanges.
lv.	lumbar vertebræ.	*pv.*	pelvis.
sv.	sacral vertebræ.	*f.*	femur.
cdv.	caudal vertebræ.	*p.*	patella.
s.	scapula.	*t.*	tibia.
cl.	clavicle.	*fb.*	fibula.
h.	humerus.	*tr.*	tarsus.
u.	ulna.	*mt.*	metatarsus.

Fig. 2. Carpus, and part of metacarpus, of *Myopotamus Coypus.*

sc. l.	scaphoid and lunare joined.	†.	supernumerary bone.
c.	cuneiform.	*mc.* 1.	metacarpal of the thumb.
ps.	pisiform.	*mc.* 2.	do. fore-finger.
tm.	trapezium.	*mc.* 3.	do. middle finger.
ts.	trapezoides.	*mc.* 4.	do. fourth finger.
m.	magnum.	*mc.* 5.	do. fifth finger.
un.	unciforme.		
*.	supernumerary bone.		

Fig. 3. Tarsus, and part of metatarsus, of *Myopotamus Coypus.*—See page 303.

cm.	calcaneum.	*c.* 2.	middle or second cuneiform.
a.	astragalus.	*c.* 3.	external or third cuneiform.
cb.	cuboides.	*mt.* 1 to 5.	metatarsal bones of the first (or inner) to the fifth toes.
n.	naviculare.		
*.	supernumerary bone, or perhaps a dismemberment of the *os naviculare.*		
c. 1.	internal or first cuneiform.		

Plate 16, Fig. 1. Skull of *Myopotamus Coypus*, half the natural size.

Fig. 1*a*. Occiput of the same.

Fig. 1*b*. Third right upper molar of ditto.

Fig. 1*c*. Second right lower molar of ditto.

Fig. 2. Skull of *Cercomys cunicularius*. From M. F. Cuvier's figure.

Fig. 2*a*. Left upper molar teeth of ditto.

Fig. 3. Skull of *Dactylomys typus*. From M. F. Cuvier's figure.

Fig. 3*a*. Upper molars of the left side of the jaw of ditto.

Fig. 3*b*. Lower molars of the left side of ditto.

Fig. 4. Skull of *Loncheres cristata*.

Fig. 4*a*. Second right upper molar of ditto.

Fig. 4*b*. Second right lower molar of ditto.

Fig. 5. Skull of a species of *Echimys*, from Bolivia,[1] natural size.

Fig. 6. Left upper molar teeth of *Echimys Cayennensis*.

[1] This skull agrees so closely in size and proportions, and the animal itself agrees so well with M. Pictet's description of the *Echimys inermis*, that I think it must be of the same species, although the Bolivian animal has no tail—it has probably been lost through some accident.

In general tint, the Bolivian Echimys is rather brighter than the common rat (*Mus decumanus*), there being a greater admixture of yellow in the colouring; and the yellow is somewhat richer. The fur is rather more harsh to the touch; it is of moderate length, and composed of soft hairs, and others which are somewhat bristly. The latter are confined to the upper parts and sides of the body, average about an inch in length, are depressed, distinctly grooved on the upper surface, and about a quarter of a line in width; they terminate in long slender points. The fur on the upper parts and sides of the animal is pencilled with rich yellow and dusky black; on the sides of the body the yellow prevails. The hairs are grey-white at the root. The whole of the under-parts are white, the hairs being uniformly white to the root. The fore-legs are of an extremely pale ashy-brown externally; the fore-feet white, not quite pure. The hind-feet are ashy-white; immediately above the heel the hairs are somewhat dusky. The ears are very sparingly clothed with fine hairs, and rather smaller than in the E. Cayennensis; the fore-feet are larger, the hinder stouter, but shorter. The hairs of the moustacheos brown, or, some of them, white. Nails white. The specimen is a male, and measures, from the nose to the rump, 9″ 6‴; height of ear, 8‴; length of fore-foot and nails, 11‴; of hind-foot and nails, 1″ 9¼‴; from heel to end of nail of inner toe, 1″ 1¼‴.

Plate 16, Fig. 6*a*. Left lower molars of the same.

Fig. 7 and 7*a*. Skull and lower jaw of *Carterodon sulcidens*, natural size.

Fig. 7*b*. Second right upper molar of ditto.

Fig. 7*c*. Incisor tooth of ditto, 1½ natural size.

Fig. 8. Skull of *Petromys typicus*, natural size.

Fig. 8*a*. Second right upper molar of ditto.

Fig. 9. Skull of *Aulacodus Swinderianus*, two-thirds the natural size.

Fig. 9*b*. Second left upper molar of ditto.

Fig. 9*c*. Incisor tooth of ditto.

Plate 18, Fig. 1. Skull of *Chætomys subspinosus*, two-thirds the natural size.

Fig. 1*a*. Second right upper molar of ditto.

Fig. 1*b*. Second right lower of ditto.

Plate 18, Fig. 2. Skull of *Cercolabes prehensilis* (below the natural size). Copied from Brandt's figure.

Fig. 3. Skull of *Cercolabes insidiosus*, ditto ditto.

Fig. 3*a*. First and second right upper molars of *Cercolabes pallida*.

Fig. 4. Right fore-foot of *Cercolabes Novæ-Hispaniæ*, slightly enlarged. The corresponding bones are marked with the same letters as in the foot represented on Plate 14, Fig. 3. The bones marked * and ** are supernumerary bones.

Fig. 5. Skull of *Atherura Africana*, two-thirds the natural size.

Fig. 5*a*. Posterior portion of the palate of ditto, natural size.

Fig. 6. Skull of *Atherura fasciculata*, two-thirds the natural size.

Fig. 6. Posterior portion of palate of ditto, natural size.

Fig. 6*b*. Second right upper molar.

Plate 18, Fig. 7. Skull of *Dasyprocta Acouchi*, two-thirds the natural size.

Fig. 7*a*. Second right upper molar of ditto.

Fig. 7*b*. Ditto ditto, much worn.

Fig. 8. Skull of *Cœlogenys Paca*, three-sevenths the natural size.

Fig. 8*a*. Third and fourth upper molars, natural size.

Fig. 8*b*. Third and fourth lower molars, natural size.

Plate 20, Fig. 1. Skull of *Hystrix cristata*.

Fig. 2. Skull of *Hystrix hirsutirostris*, vel *leucurus*.

Fig. 3. Skull of *Hystrix Hodgsonii*.

Fig. 4. Skull of *Hystrix Javanica*.

The above four skulls are represented of half the natural size.

ADDITIONS AND CORRECTIONS.

Page 155, line 3, *for* "depth," *read* "width."

" 163, " 9 from bottom, *after* "marked *a* in figs. 1, 2, 4, &c." *add* "of Plate 6."

" 177, " 1, under the dimensions, *for* "Pl. 6, fig. 3," *read* "Pl. 6, fig. 12."

" 265, " 6 from bottom, *for* "S. lat. about 75," *read* "S. lat. about 35."

" 281, The dimensions in the first column are those of the skull (Pl. 10*, fig. 4) of "*Ctenomys Boliviensis*," not "*C. Braziliensis*."

" 333, The letters referred to in the foot-note were accidentally omitted when lettering the plate.

" — " 2, *for* "figs. 1 and 1A," *read* "figs. 6 and 6A."—The plate in some copies is numbered 16; *see* Explanation of Plates.

" — " 11, *for* "Pl. 16, fig. 1*b*," *read* "Pl. 16, fig. 6*a*."

" 334, " 4, *instead of* "without including the tail," *it should no doubt be* "including the tail."

" 349, " 3 of diagnosis, *for* "without any admixture of soft hairs," *read* "without any admixture of stiff hairs."

" 350, The reference-mark for the foot-note *should be added* after the name "*antricola*," which occurs four lines above.

" 361, " 5, *for* "pterygoids," *read* "pterygoid."

END OF VOL. II.

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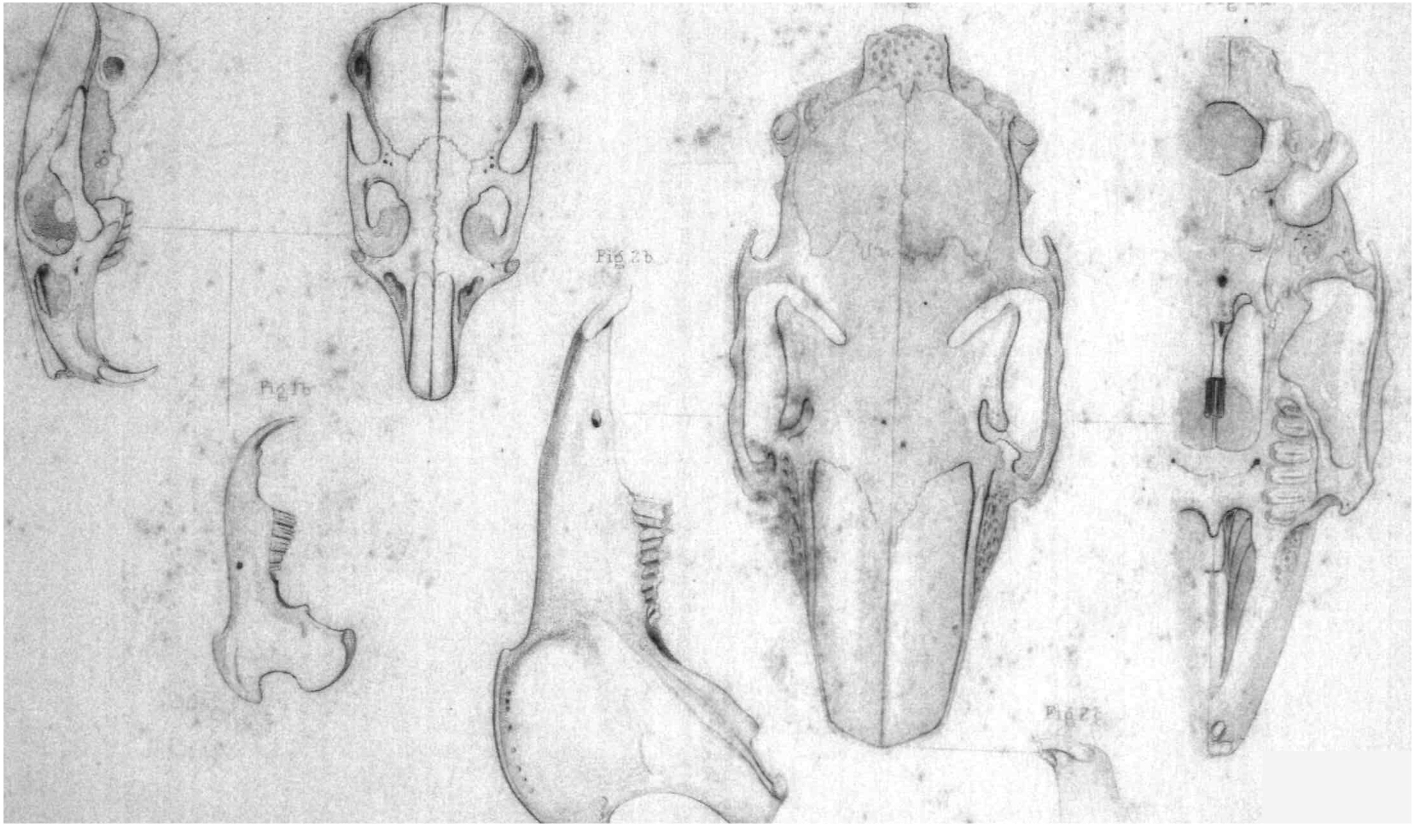
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Fig 2b
Fig 2c

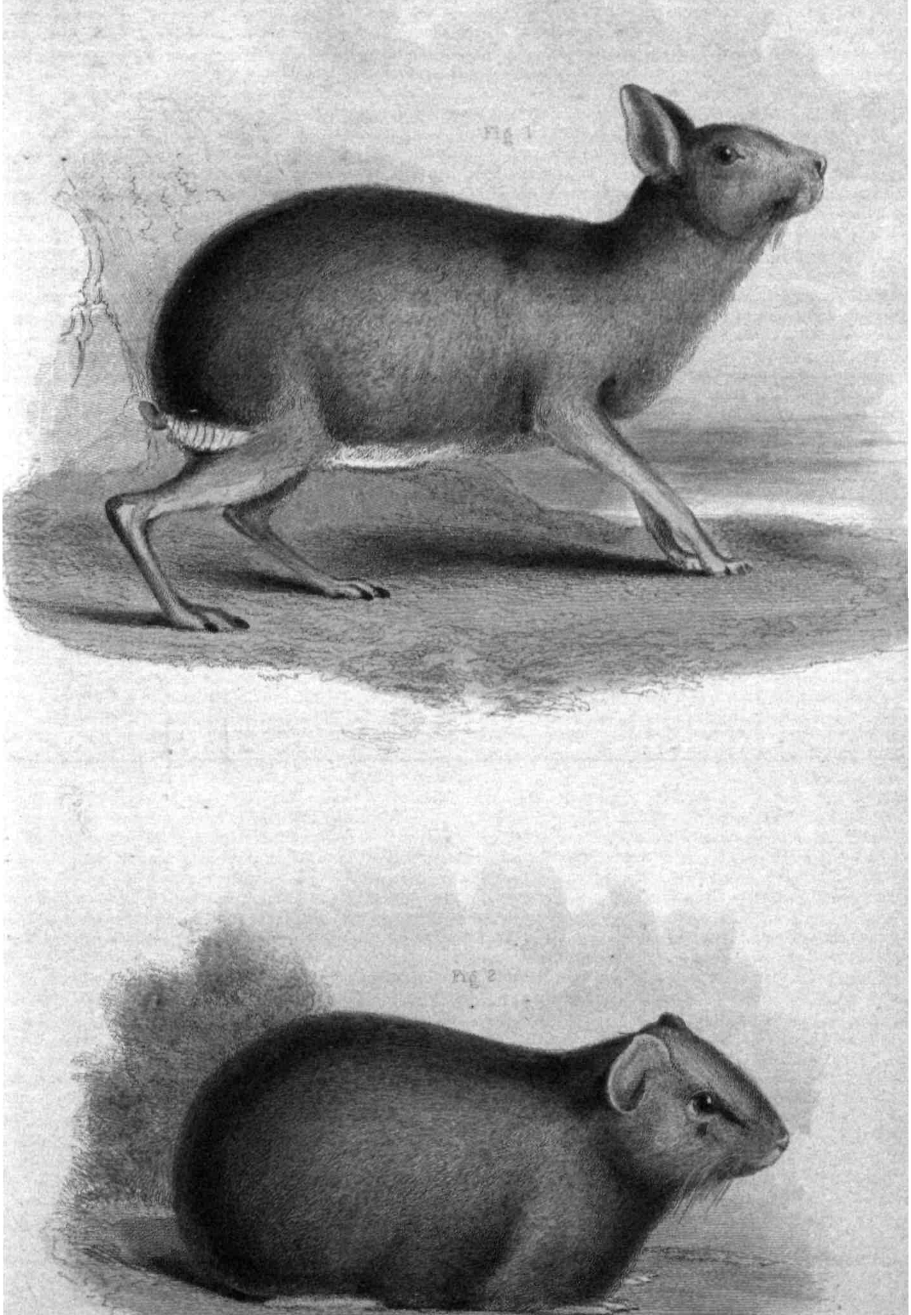
Fig 1
Fig 2

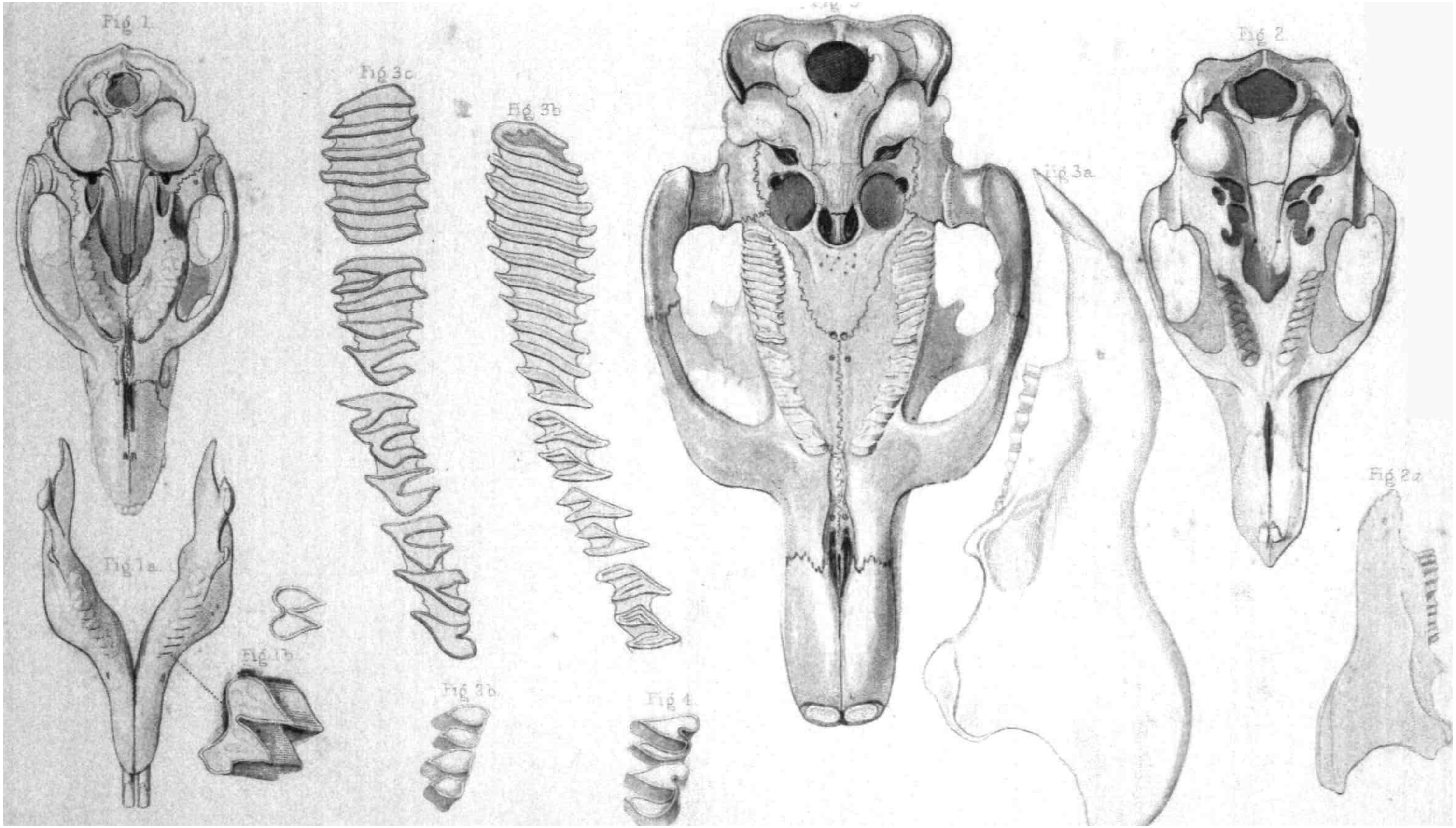
Fig 1.
Fig 1a.
Fig 1b.
Fig 3c.
Fig 3b.
Fig 3b.
Fig 4.
Fig 3a.
Fig 2.
Fig 2a.

Fig 1 LAGOSTOMUS TRICHODACTYLUS Fig 2 & 2a HYDROCHŒRUS CAPYBARA & ITS

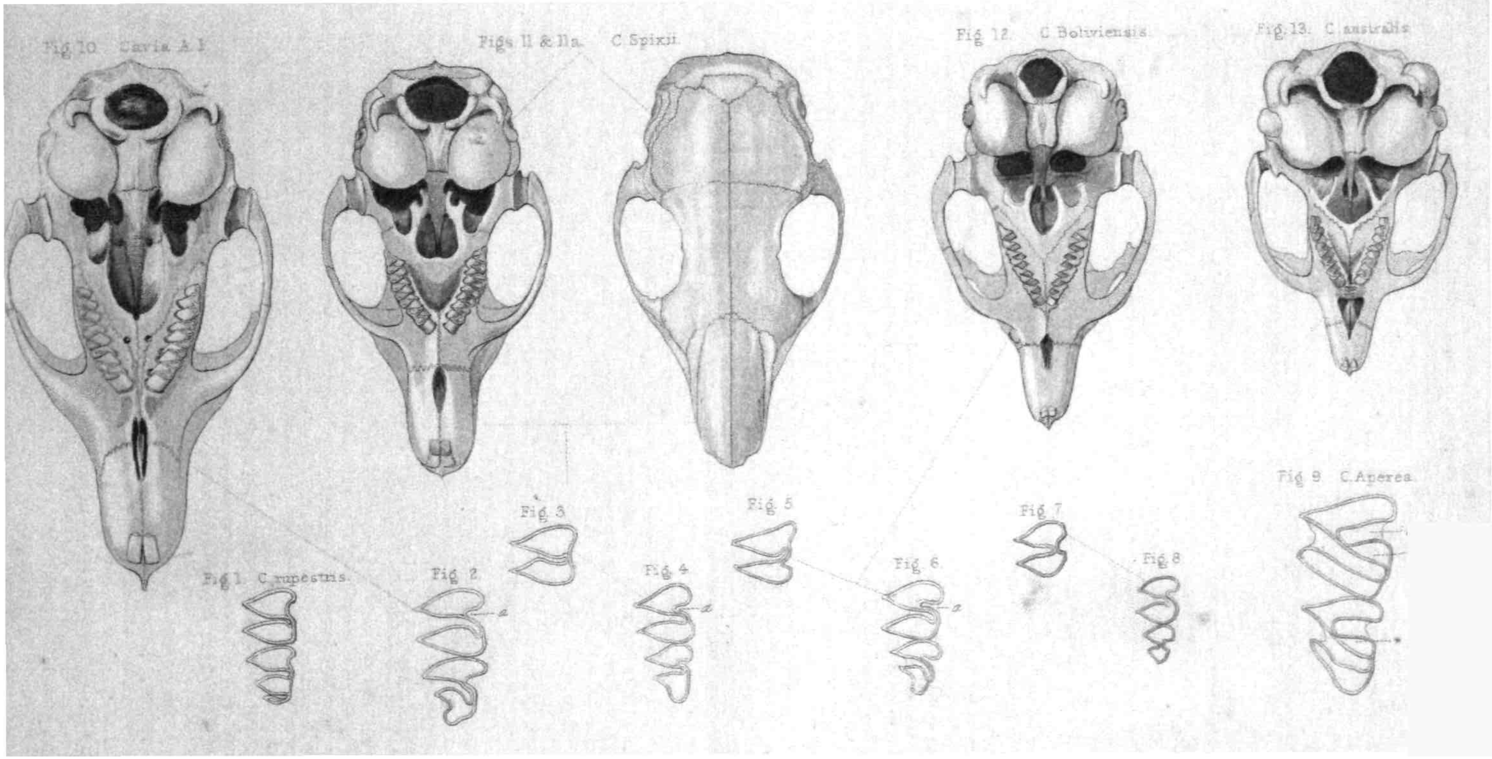
Fig. 10. Cavia A. I.
Figs. 11 & 11a. C. Spixii.
Fig. 12. C. Boliviensis.
Fig. 13. C. australis.
Fig. 9. C. Aperea.
Fig. 3
Fig. 5
Fig. 7
Fig. 1. C. rupestris.
Fig. 2
Fig. 4
Fig. 6
Fig. 8
a

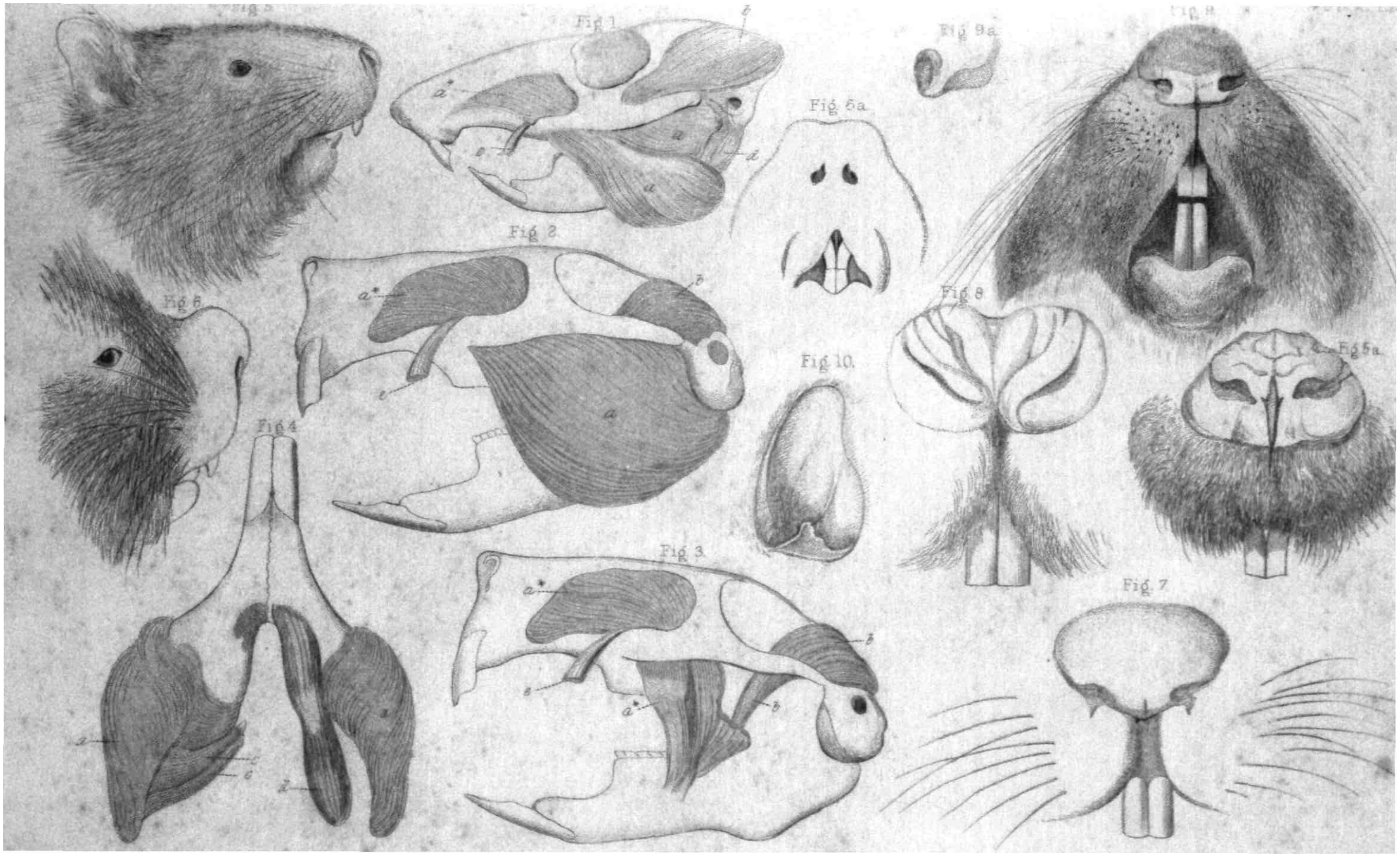
Fig 1
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Fig 10

Fig. 1

Fig. 2

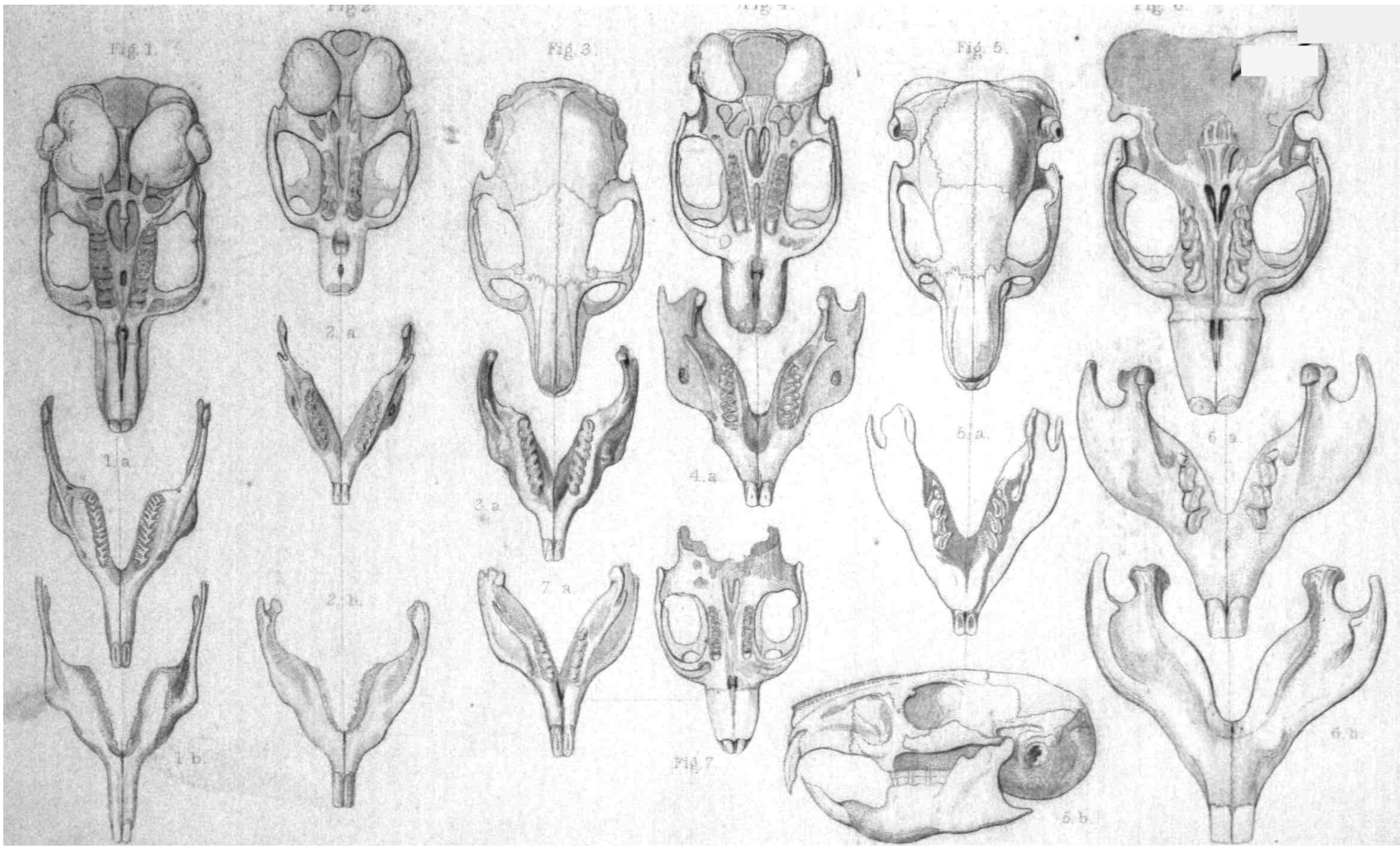

Fig. 1.
Fig. 2.
Fig. 3.
Fig. 5.
1. a.
1. b.
2. a.
2. b.
3. a.
4. a.
5. a.
5. b.
6. a.
6. b.
7. a.
Fig. 7.

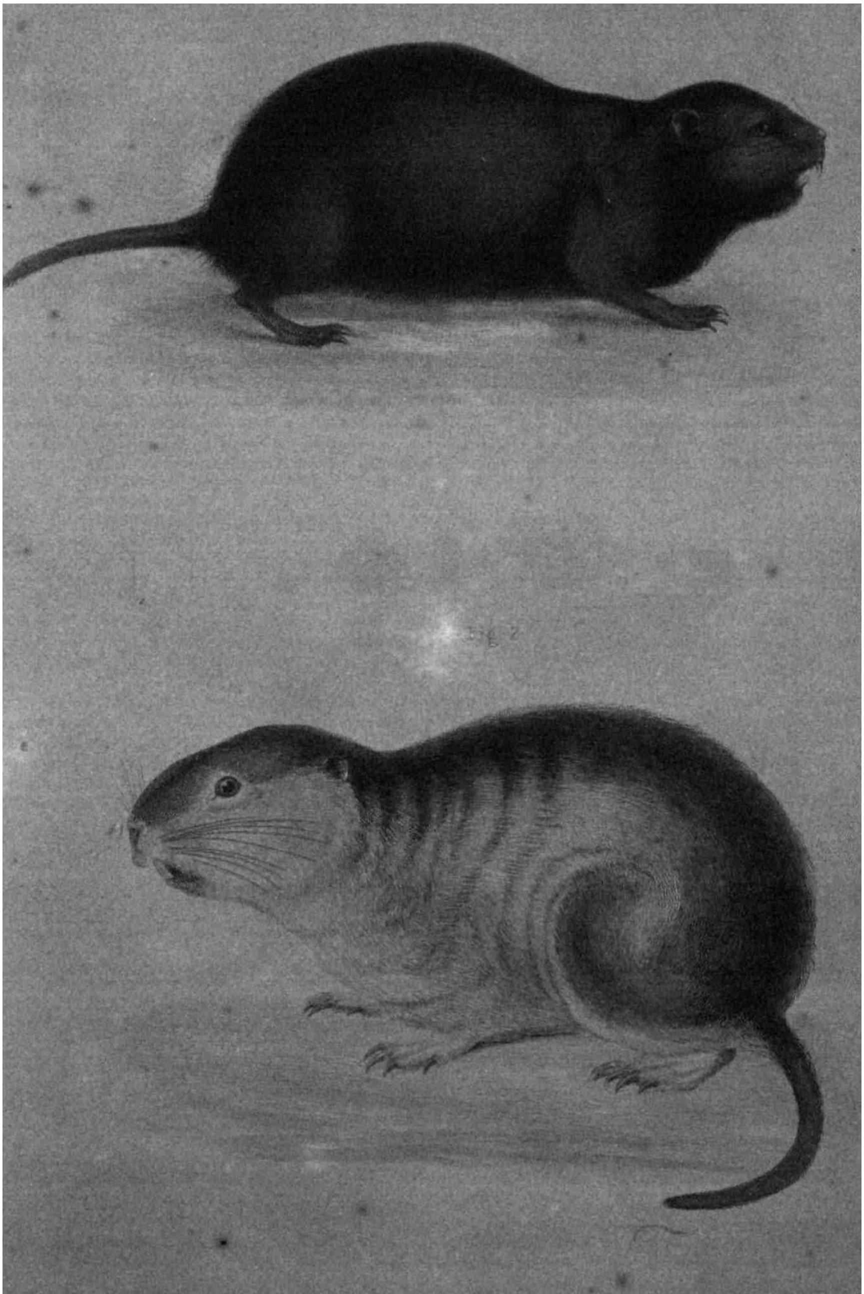

Fig. 1 SPALACOPUS POEPPIGII. Fig. 2 CTENOMYS MAGELLANICUS.

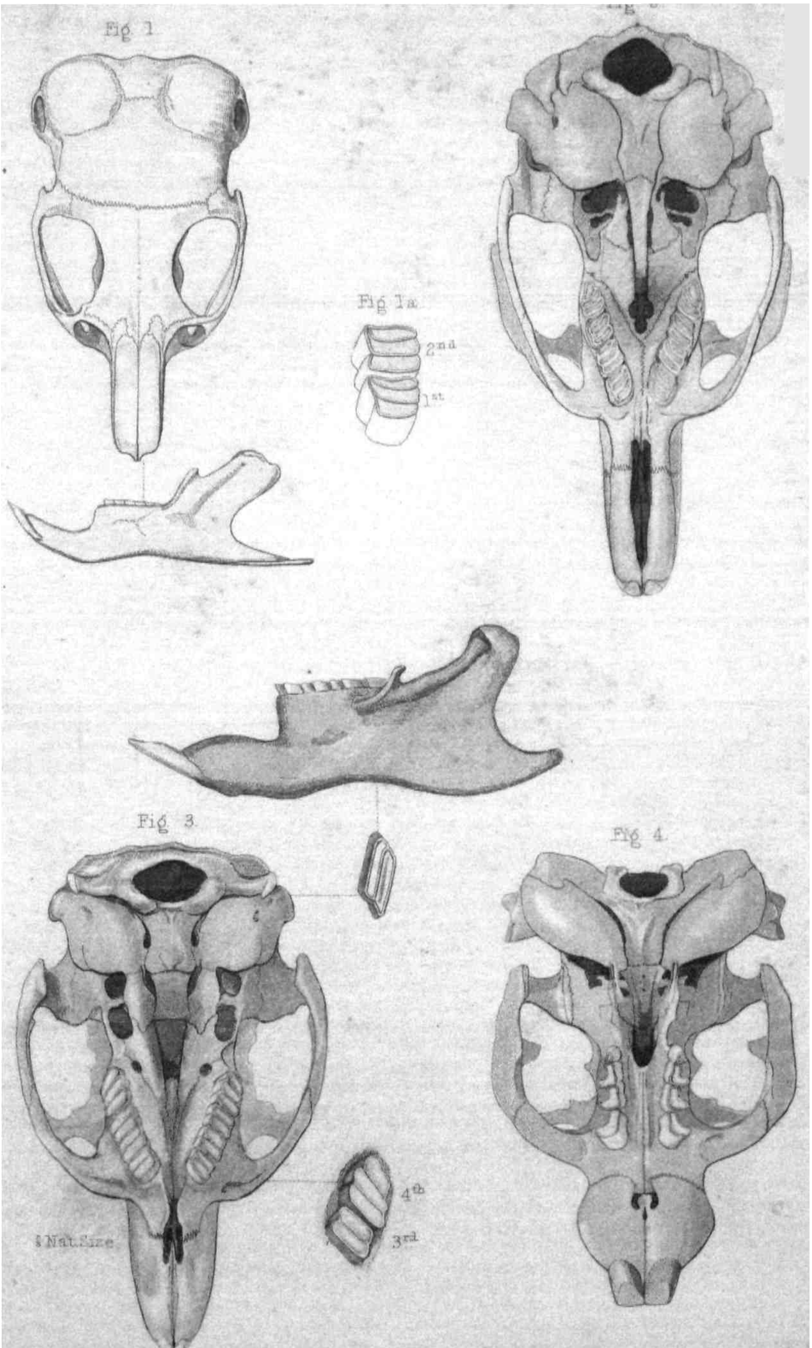

Fig. 1. CHINCHILLA LANIGERA. Fig. 2. LAGIDIUM CUVIERI.
Fig. 3. LAGOSTOMUS TRICHODACTYLUS. Fig. 4. CTENOMYS BOLIVIENS

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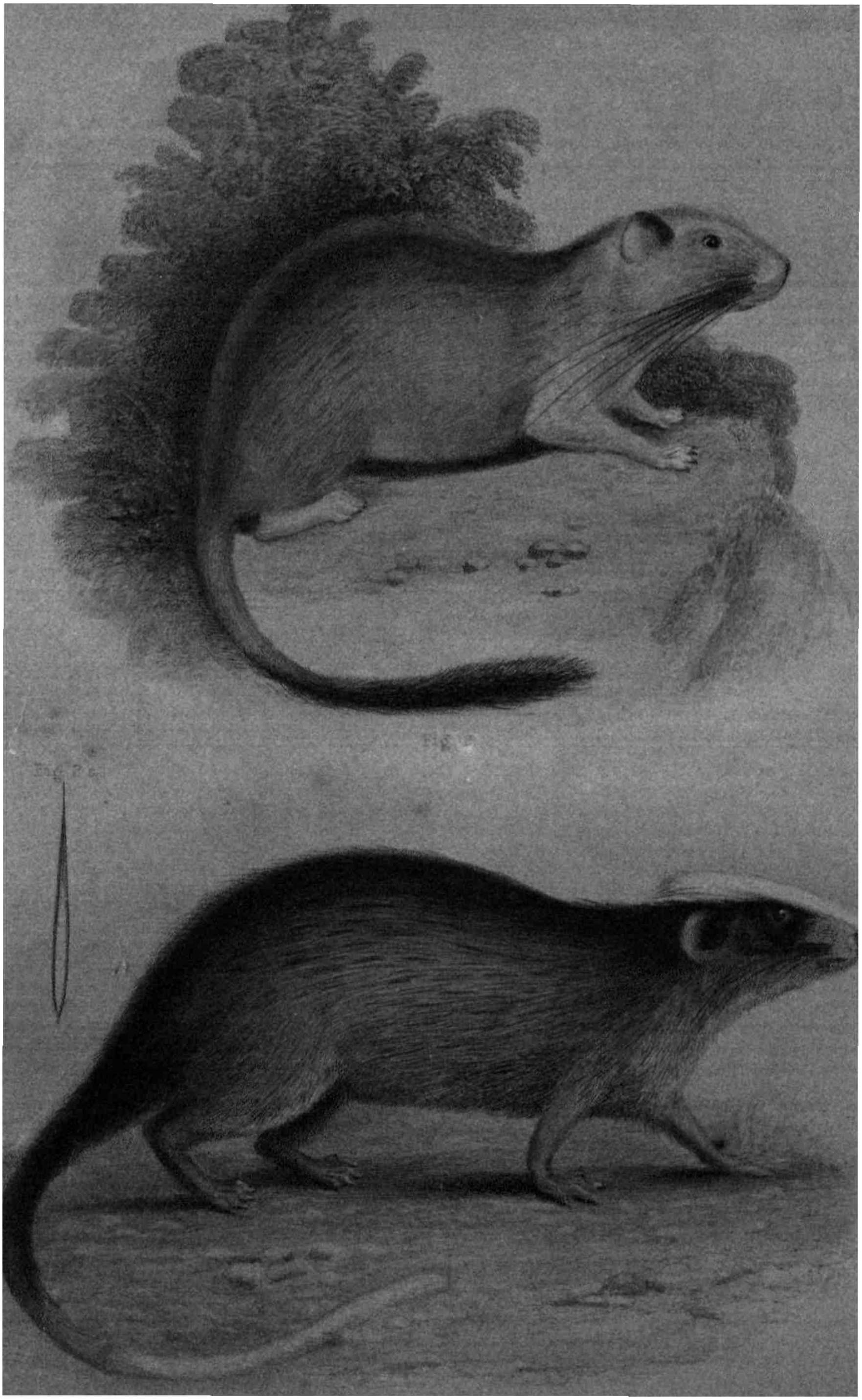
Fig. 2